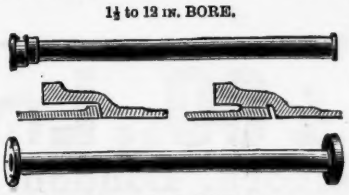
THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. LXX. No. 1784.] LONDON, JULY 20, 1897. [49TH YEAR. PRICE 6d.

GAS AND WATER PIPES

1½ to 12 IN. BORE.



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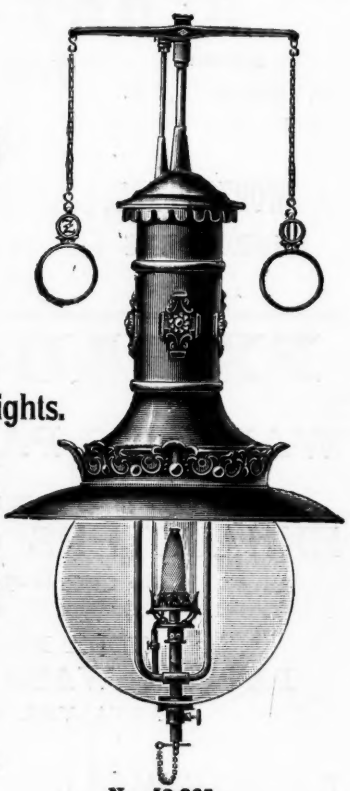

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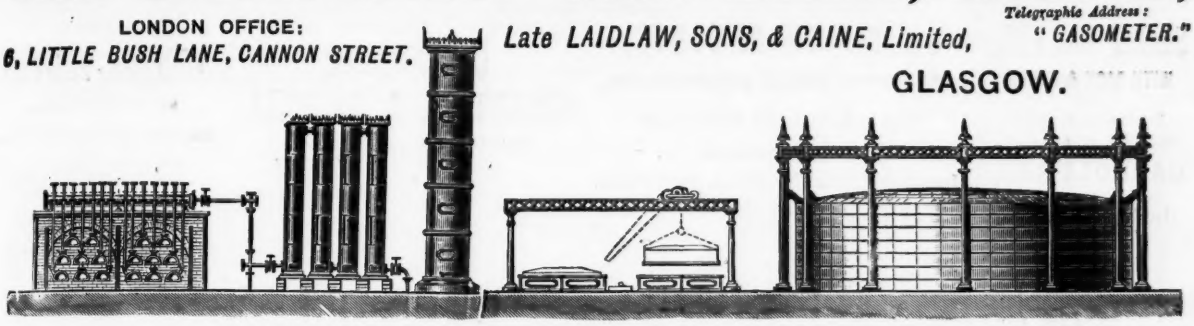

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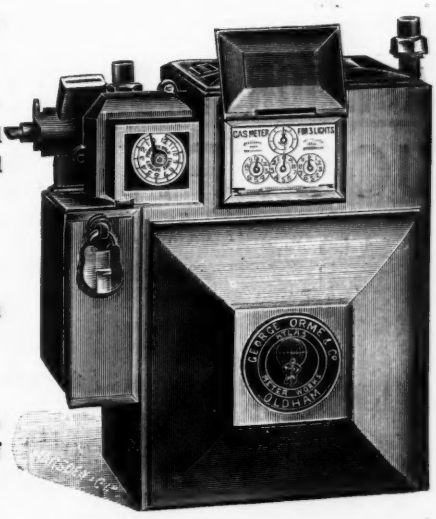

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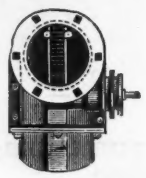

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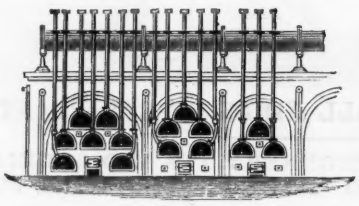

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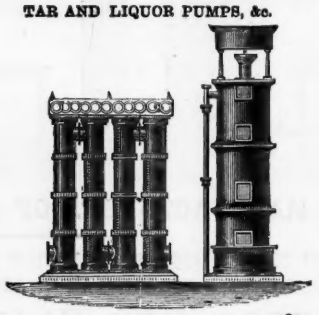

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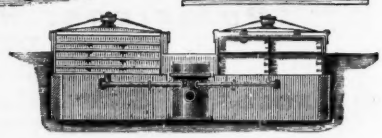

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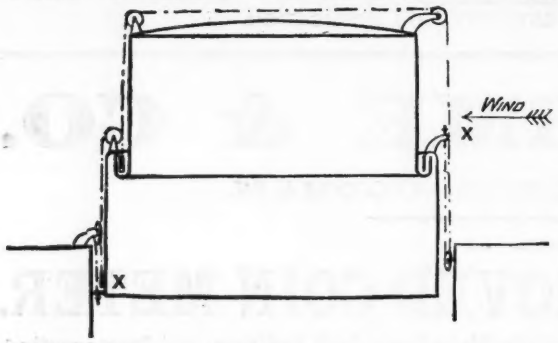

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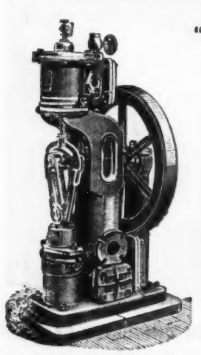

Fig. 705. "SINGLE RAM" STEAM-PUMP.

Fig. 593. "CORNISH" STEAM-PUMP FOR BOILER FEEDING, &c.

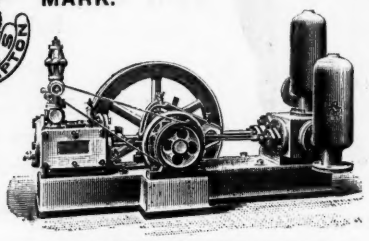

Fig. 685. "RELIABLE" STEAM-PUMP FOR TAR AND THICK FLUIDS.

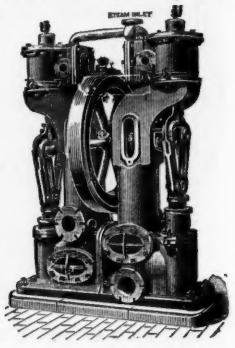

Fig. 712. "DOUBLE-RAM" STEAM-PUMP.

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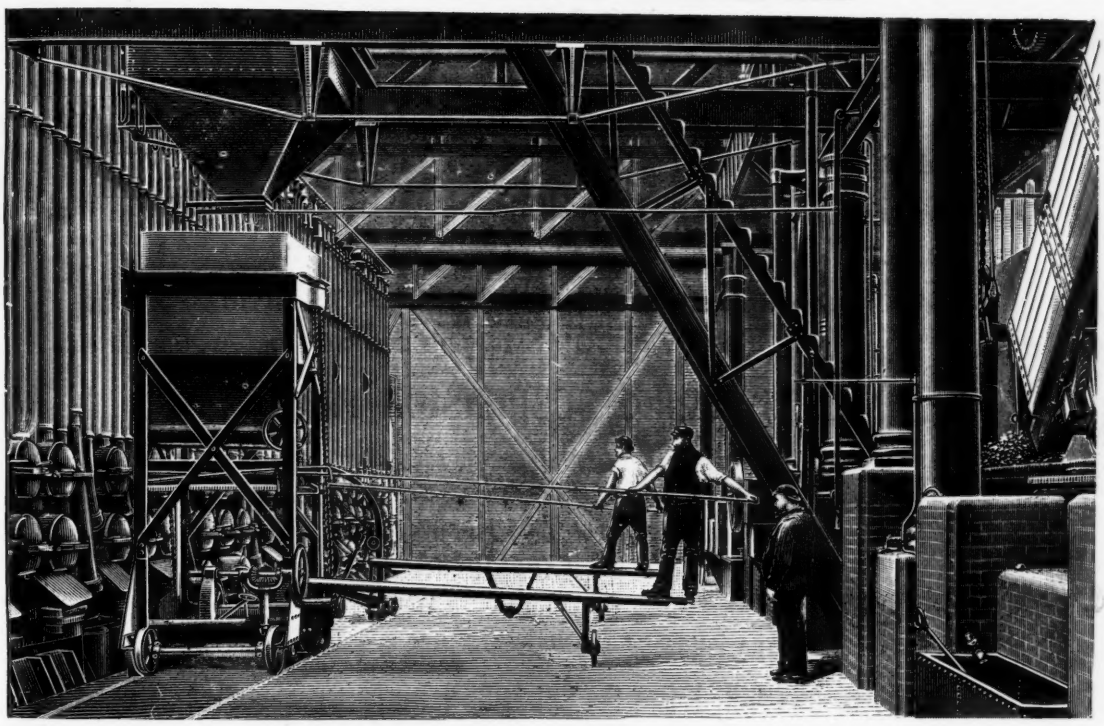
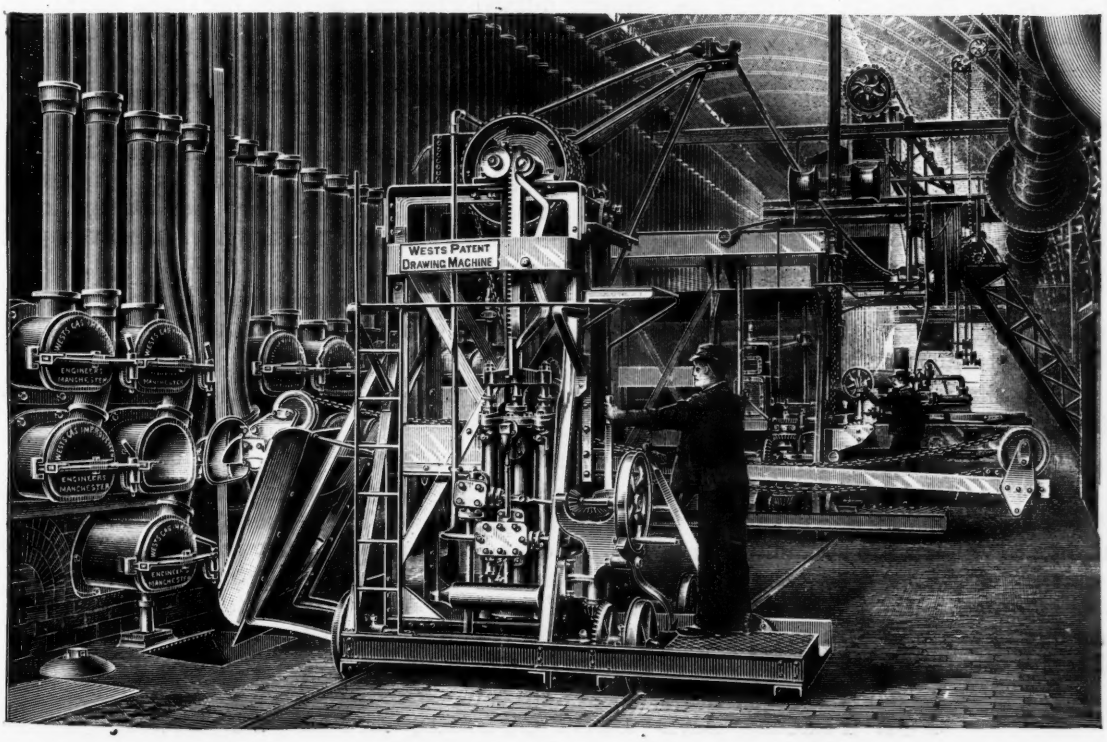


West's Manual Charging and Drawing Machines.



West's Compressed-Air Drawing and Charging Machines.

Contractors for

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IMPROVEMENTS IN STREET LIGHTING.

Highest Efficiency with Greatest Economy.

LIGHTING AUTHORITIES, GAS ENGINEERS, and GAS MANAGERS

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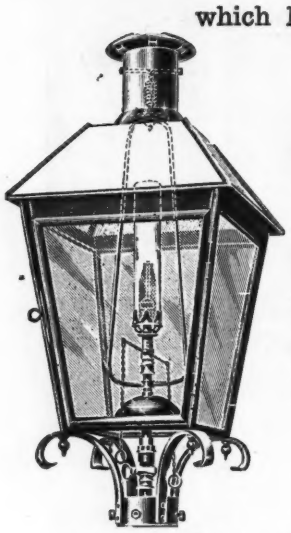
INCANDESCENT GAS-LIGHT

(Welsbach System),

which has now been successfully adapted to the purposes of

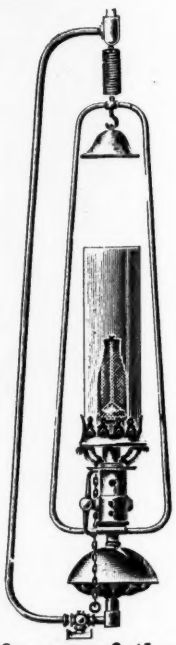


STREET LIGHTING,

the difficulties caused by VIBRATION having been OVERCOME by the use of the

NEW SPRING SUSPENSION FRAME (Patent).

This System of Lighting meets the requirements of all Lighting Authorities in those Districts where it is desired to effect an Improvement in Street Lighting WITHOUT INCREASE OF EXPENDITURE.



The following are Extracts from a PAPER read by Mr. F. G. DEXTER, before the SOUTHERN DISTRICT ASSOCIATION.

"The success of the experimental (Welsbach) lighting secured the contract for one of the Parish Council Districts; and this was shortly followed by the contract for three years for the city lamps. The total represents altogether about 500 single lamps, and 15 refuge lamps containing two lights."

"In the matter of maintenance of the street lights, the record is favourable—in fact, more so than the estimate provided. By the test-meter, the average daily consumption works out to 38 cubic feet per light, including bye-pass. The bye-pass consumes with a flame half an inch long, $\frac{1}{6}$ foot per hour. This represents 1000 cubic feet per lamp per annum. The average consumption per light, when in use, works out to 12,900 feet per annum, or about $3\frac{3}{5}$ feet per light per hour. The lighting is continued all the year round, from the average times of one hour after sunset to one hour before sunrise."

"The mantles have worked out to an average of three per lamp per annum; but, bearing in mind the absence of frost last winter, the writer believes that four mantles per light is more likely to represent average conditions."

"In the matter of cleaning, it may be said that the lanterns require less attention than with the ordinary flat-flame burner."

"The number of lights attended to per man averages 85."

"The 'Welsbach' Light is undoubtedly one of the greatest aids to successful competition that the Gas Industry has ever experienced. Its influence, while reducing the relative cost of light, has advanced the consumption of gas all over the country by the increased satisfaction of the existing consumers, and the attraction of others. The writer feels that its influence should not be confined to the house. It is capable of meeting every competitor in the street, from cheap oils to arc lights, in cost and in effect; and it is hoped that the foregoing experience may lead many others to seek its aid and to realize its efficiency."

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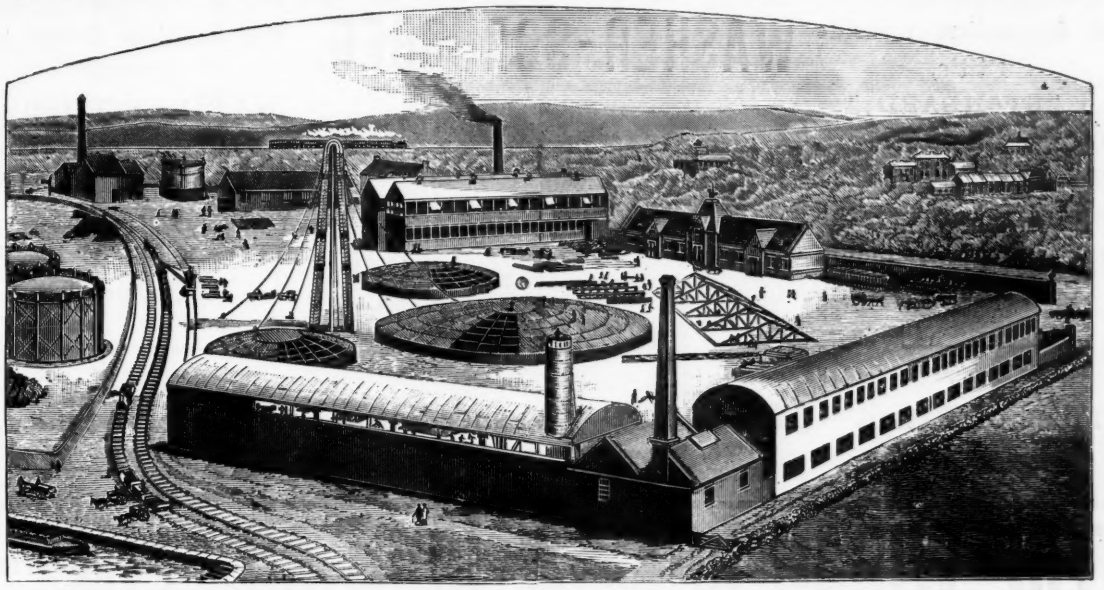

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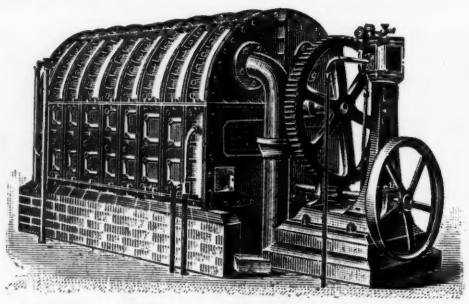
PATENT "STANDARD" WASHER-SCRUBBER.

This Apparatus upholds its title, the "STANDARD;" being recognized by leading Engineers as the most efficient Apparatus for the Extraction of Ammonia from Coal or other Gases.



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Number of Patent "STANDARD" Washer-Scrubbers in use at this date

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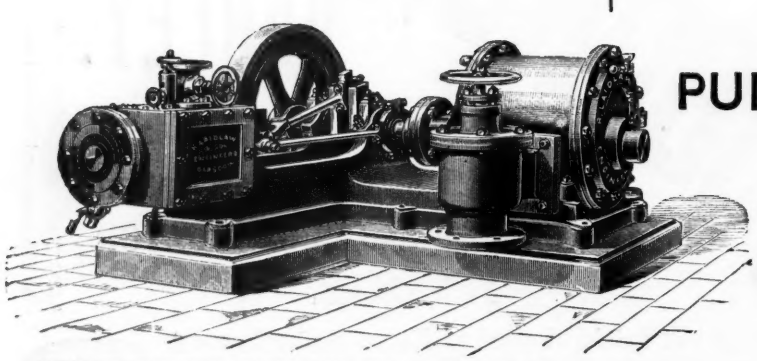

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Belfast	1,700,000	Winchester	200,000
Belfast (Second Contract)	4,500,000	Holyoke, Mass.	600,000
Glasgow	300,000	Hoylake	125,000
Brussels	700,000	Shanghai	225,000
Brussels (Second Contract)	700,000	Stockport	500,000
Liverpool	3,500,000	St. Joseph, Mo.	750,000
Tottenham	750,000	Lea Bridge	350,000
Tottenham (Second Contract)	750,000	Lea Bridge (Second Contract)	350,000
Santiago	400,000	Guildford	350,000
Swansea	750,000	Stockton-on-Tees	500,000
Manchester	3,000,000	Syracuse, N.Y.	850,000
Brighton	1,750,000	Brentford	1,200,000
Preston	1,500,000	Commercial Gas Co.	850,000
New York	1,200,000	Commercial Gas Co. (Second Contract)	850,000
Southport	750,000	Bridlington	125,000
Bath	1,000,000	Middlesbrough	1,250,000
Newburgh, N.Y.	350,000	Croydon	1,250,000
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Edinburgh	2,000,000	Taunton	225,000
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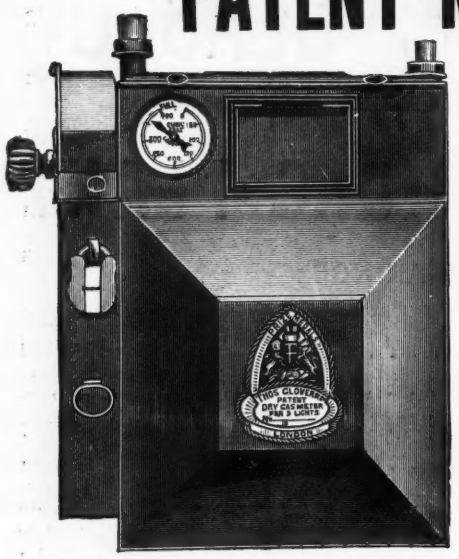

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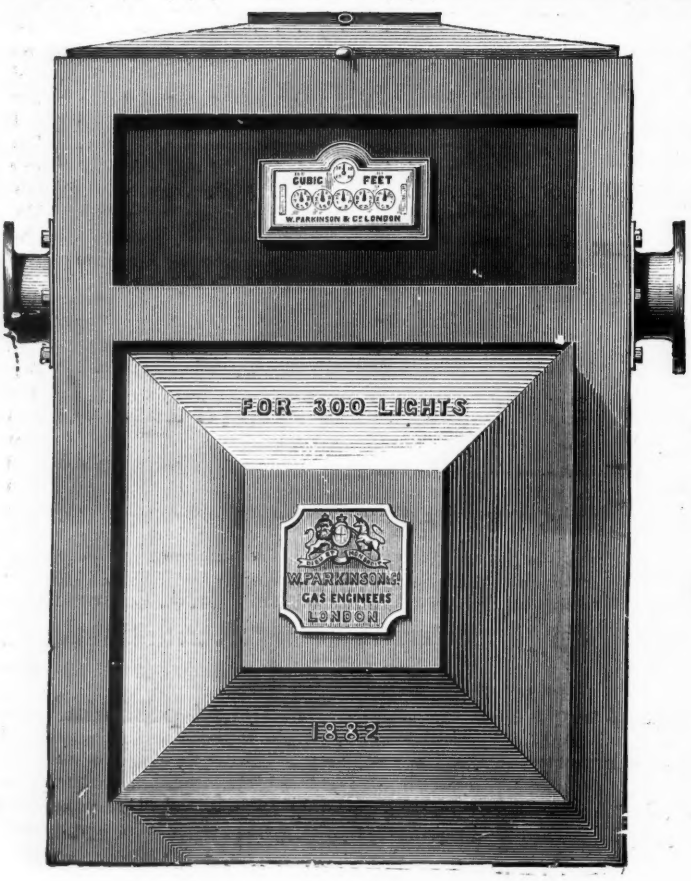

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EDITORIAL NOTES.

The Third Reading of the Workmen's Compensation Bill.

THE Workmen's Compensation Bill was read the third time in the House of Commons, without a division, on Friday, and it therefore goes to the Lords with the best of all possible endorsements. This fact, moreover, justifies the attitude which has been maintained in the "JOURNAL" with regard to the Bill from its introduction. The consideration of the measure as amended was resumed on Monday last week, when another abortive attempt was made to further postpone its coming into operation. A discussion sprang up on the difficult question of compensation to partial dependents; and a number of amendments were moved, only to be withdrawn by leave. Mr. Seton-Karr succeeded in procuring acceptance of an amendment designed to prevent malingering. A long and somewhat acrimonious debate took place upon a proposal by Mr. Pickersgill to leave open the amount of commutation. Mr. Bainbridge asserted that unless the extent of the employer's liability was defined, it would be impossible to insure; and eventually the limitation of commutation to "three hundred and "twelve times the weekly payments payable at the date "of the application" was sustained. It having been provided in the Bill, by an amendment carried in Committee, that parties to proceedings taken under the Act should not appear or be attended by solicitors or counsel, except by leave, the Attorney-General moved to strike out the subsection, in consequence of representations that had been made to him as to the probability that it would encourage sharpers. This is a delicate question. The amendment excluding legal practitioners from having a finger in the pie, except by leave, was accepted by the Government for obvious reasons. It is extremely difficult, however, to make sure of one's ground when it is a question of attempting to reduce the costs of legal proceedings. Mr. Chamberlain candidly told the House that he had been one of those who thought this object might be obtained by cutting out the legal profession; but that upon further consideration he had come to the conclusion that the Attorney-General was right. The House thought so too, and restored the lawyers.

On Thursday the formal motion for the third reading was the occasion of an interesting debate, in which the chief arguments for and against the Bill, political and otherwise, were gone through once more. Mr. Asquith repeated his familiar performance of praising the measure as a whole, and picking holes in its provisions. The late Home Secretary did not advance anything new as to the errors and omissions of the Bill as it leaves the House of Commons. He declared that what his side of the House approves in this legislation is the principle, which it applies for the present only to particular trades, "that "the charge for making good, as far as money can, injury "sustained by workmen, shall, on grounds of public "policy, be thrown on the community at large." Mr. Chamberlain, in reply, made one of the best speeches he has ever delivered, and one that has rarely been surpassed in the House of Commons. It will echo and re-echo through the Palace of Westminster for many a day—not for its mere eloquence, of course; for, happily, oratory as such is neither in Mr. Chamberlain's line nor to the taste of the present House of Commons. The supreme merit of the speech consists in its clear, temperate, reasonable statement of what, without exaggeration, may be entitled the new People's Charter now brought in by a great departure in legislation relating to the regulation of industry. It declared that this legislation proceeds upon two principles. The first is "that every workman in "the trades specified in this measure will, in future, be "entitled of right to moderate and reasonable compensa-"tion for all the accidents which may happen to him "in the course of the business in which he is en-"gaged, unless those accidents are caused by his "own gross and wilful default." The second principle is "that this compensation should be a charge upon "the trade or employment in which the accident "occurs. . . . The principle is that the compensation is "not a fine upon the employer, but it is a recognition of "the just claim of the workman." In other words, the right of the workman to compensation for accidental injury is for the first time made as much a charge upon the business as the repair and maintenance of the machinery.

No longer will an unscrupulous employer be able to throw aside a disabled worker like so much human scrap, for the community to pick up and care for if it can. The new law will not touch those employers who already recognize their responsibilities; but it will bring into line with them the soulless limited liability companies and the hard-dealing masters who have carried on business at the peril of the lives and limbs of their workpeople.

Mr. Chamberlain was well backed up by Sir E. Clarke, who, to the intense delight of the House, in stinging phraseology dared the critics of the Bill to vote against it. Mr. Balfour then closed the debate with a brilliant speech, in the course of which he made effective use of a timely communication from Mr. George Livesey to the Attorney-General, announcing the adoption by the South Metropolitan Gas Company's workmen of the Mutual Accident Fund scheme, as recorded in last week's "JOURNAL," and more fully described in another column. The particular point to which Mr. Balfour was addressing himself was almost the only one upon which there has been real difference of opinion between the Government and the majority of the House of Commons. This was the question of the effect of the Act upon all those arrangements that are grouped under the generic term of "contracting out," which figured so potently among the electoral pledges of 1893. The Leader of the House was engaged in demonstrating the agreement of the Bill with the famous "Dudley clause," which expressed the opposition of his present supporters to Mr. Asquith's Bill. At the "psychological moment" of his argument, Mr. Balfour read parts of a letter written by Mr. Livesey to the Attorney-General, conveying the intelligence that, as a matter of fact, the new Accident Fund scheme had been adopted by all the thousands of the Company's workmen "bar one"—verily, the exception that proved the rule of the general acceptability of the arrangement. This striking incident enabled the speaker to declare that "one penny-"worth of experience is worth a thousand pounds of theory," and to clinch the argument with the statement that "here we "have the best evidence which can be conceived in such a "matter—a great Company, even before the Bill becomes "law, making such arrangements with their workmen as "will conform with the provisions of the Bill. Whatever "may be the future of contracting out—and I hope it has "a great future before it—let it not be pretended, after "this letter, that the provisions of this Bill are a conclusive "bar to its being carried out." Mr. Livesey might be pardoned for feeling a faint thrill of pride at the part he thus played in smoothing the way of the Imperial Government towards the achievement of one of the noblest legislative reforms of the century. So an historic debate ended with the passing of the Bill amid cheers.

Every reader of these necessarily brief remarks should also read "The Times" report of the discussion, which appeared in the issue for last Friday. It is a treat that those now living who agree with the late Laureate, that "the thoughts of men are widened with the process of the "suns," cannot look to have repeated often in their experience. The industrial clock has been moved forward a space that, please God, shall never be set back any more.

The Law as to the Indications of Consumers' Meters.

REPRESENTATIONS have been made to us respecting the case reported in the "JOURNAL" last week from Richmond, in which a consumer was summoned by the Gas Company for non-payment of a Lady-day account amounting to £16 14s. It was pleaded for the defence that the bill for the corresponding quarter of the previous year was only £2 11s. 11d.; and while it was admitted that there had been greater consumption of gas for the quarter in dispute, it was denied that this was sufficient to account for such an enormous increase of charge. The evidence tendered on both sides was strictly of the kind usual in such cases. The Company showed that the meter had been tested and found to register accurately; and the consumer brought servants and inmates of the house to swear that the gas could not have been burnt as alleged. In the event, the Magistrates found that £6 6s. 10d. was a fair charge in the circumstances; and they gave judgment for this amount.

It is difficult for gas managers to see the justice of such decisions; and in our experience they show unconquerable reluctance to believe that this way of treating a gas account, based on a tested meter registration, is strictly according to law. There is, however, nothing really new about this Richmond judgment, which only repeats what has been done by Magistrates over and over again from a time running back to the beginning of the gas industry. Yet we are probably right in thinking that nine gas managers out of ten will regard it as a miscarriage of justice. Perhaps it is. Possibly the Richmond Bench have erred in their finding, in point of fact; but they are unquestionably right in law. It will be as well for gas managers to take this lesson to heart. The consumer's meter is nothing more than a mechanical contrivance, to which in its wisdom the Legislature has denied the status of an agency competent to overrule sworn testimony. The indications of the meter are *primâ facie* evidence of the quantity of gas that has passed through the instrument, which means that the onus of proving anything to the contrary rests upon the party that may dispute the figures. As is only natural, this party is usually the consumer; but it must not be overlooked that the right belongs equally to the vendor. There is not the smallest probability that this condition of the law with regard to the sale of gas will ever be altered, and if the proposal were made to raise meter indications to the character of positive evidence of the fact, we are not sure that the change would be in the interest of the gas industry. Consequently, wisdom counsels that the actual order of things should be put up with in a sensible manner.

Considering the volume of the trade done in gas, it is really wonderful that such cases as the one under notice are so rare. Taking the country through, they do not amount to one a year. Probably there are many more instances, which are prevented from getting into Court by the exercise of the spirit of compromise which is supposed to be a product of the soil of England. We do not presume to offer any remarks upon the merits of the Richmond case. Both sides appear to have deserved sympathy; and it would be idle to complain because the Bench thought the consumer needed more practical help over the difficulty than the Gas Company. Having confessed the strength of the Company's case, we may be pardoned for remarking that the position of a consumer confronted with a gas bill suddenly swollen to sevenfold the former figure is not destitute of a pathetic aspect. There is a whole sheaf of morals to be found in this little story; but we leave our readers to draw them out.

The Trouble of the Engineering Trade.

BY all accounts, the country is at the moment of writing in the throes of a strike and lock-out in the engineering trade; and yet it is practically impossible to state with reasonable approximation to the truth how many men are actually "playing" in connection with this upset of the trade, so deliberately planned by Messrs. Barnes and Co. This uncertainty with regard to the facts is one of the normal concomitants of these industrial disputes, and was put forward in high Governmental quarters at the time of the formation of the Labour Department of the Board of Trade as one of the causes of unnecessary warfare which the new official organization was to remove. Yet here we are again in the thick of another trouble of the kind; and nobody—least of all those most intimately engaged—knows or will tell the extent of the dislocation of trade. It was surmised by "The Times" that, "sooner or later, 100,000 to 200,000 "men will be feeling the effects of the measures taken in "consequence of a strike of inconsiderable dimensions in "London." Mark the vagueness of this forecast. What would be thought of a general who did not know to within closer limits than this how many of the enemy were likely to be placed in the field against him? One can agree with the writer that "it is a reflection on the good sense "of the community, evidence of the remains of a state of "barbarism, that one can find no mode of averting all "this threatened misery and loss. It is a bitter satire "on the talk in recent times about conciliation and arbi-"tration that nothing is done to bring about a settlement "of a dispute between employers of intelligence and the "largest centralized Trade Union in the kingdom with a "staff of competent and experienced officials." That is just it. We have had Trade Union conferences galore meeting and passing long-winded resolutions in favour of mediation in industrial disputes; we also have Government offices created by serious-minded Ministers, and filled with lucky Trade Union officials; and yet, on the showing of the General Secretary of the Amalgamated Society of Engineers, only the favourable opportunity

was awaited for beginning a "trial of strength" with the Employers' Federation! Where be your Roseberys and your Mundellas now? Without a thought of asking the Government, or any other agency for conciliation, whether the employers could reasonably concede the eight-hour day with nine hours' pay, the Trade Unions demanded it, with threats; and then "the fat was in the fire." All this goes to prove the hollowness of the contentions so often advanced by the partisans of Trade Unionism: (1) That these organizations make for peace, not war; and (2) that it is better for all parties when a trade is strongly organized, as the employers have a responsible, reasonable body of official representatives of the men to deal with.

Upon the merits of the men's claim, we are as little disposed as ever to pronounce an opinion. The question as to whether or not the engineering employers, first of London and afterwards throughout the country, can afford to concede it, is a matter for individual decision. The industrial world is actively engaged in working out its destinies under different conditions in different regions of the earth's surface. We are not greatly alarmed at the bogey of Continental competition which is raised in some quarters. The long hours and small wage of the European mechanic do not give his employer the advantage over the Englishman. The competition of the highly-paid American mechanic, working his ten hours a day, is more to the purpose; but this is not the whole of the matter. So far as the actual condition of British engineering is concerned, we are inclined to think that the competition of one home district with another is more mischievous, both to masters and men, than any rivalry from without. The Trade Unions, to our thinking, are exhibiting great folly in striking for an eight-hour day for London alone, if they must strike for it at all. It was reported in Thursday's papers that at a mass meeting held on the previous day in Glasgow, Mr. George Ferguson, the organizing delegate for Scotland, gave an "unqualified denial" to the statement that had been circulated to the effect that the Scotch engineers were only "waiting until those in "London got the eight-hour day to demand it too." Why not? A letter of Mr. A. F. Hills, of the Thames Iron-Works, appearing in "The Times" of Thursday, throws a strong light upon the practical working out of this question. His Company have conceded the eight-hour day, and profess to be satisfied with the result; yet in the same breath he complains that for the past six years the Government have only given to the Thames the contract for one battleship, and "at a price that excludes "all possibility of profit," while a firm at Barrow have received seven millions sterling worth of similar orders. What are the conditions of labour at Barrow?

Supposing, therefore, that the Trade Unions succeed in forcing the London employers to concede the eight-hour day with nine hours' pay. This may conceivably happen, assuming the London employers to have reasons of their own for yielding the point. What is likely to follow? None but the very best and smartest hands will have a "look in" at London shops, which will be given over more and more to local, fine, and specialized branches of the trade. The heavy engineering work of the country has long left London, and appears to domicile itself from time to time in out-of-the-way places, where there happen to be material facilities and no embarrassing shop customs. Thus Barrow, and more recently Pallion, have arisen to compete for orders with the old centres of the industry. The unemployed London mechanic now has to make his sorrowful way to these new places, where, with the connivance of his Union, he falls into the local order. There is no eight-hour day there; and the wages are on the local scale. Still the man is a member of his Society, and has to pay his dues. By-and-bye, when he wants to reap the benefit of his lifelong contributions, he finds the funds have gone in gaining that glorious victory of the eight-hour day for London! Then he will understand, when it is too late, the force of what we now say about the disastrous competition of one home district with another. Would that our words could reach those whom conviction on this head might save from industrial suicide.

The Vacancy on the Board of The Gaslight and Coke Company, caused by the recent death of Mr. John Orwell Phillips, has we understand, been filled by the appointment of Mr. Corbet Woodall, M.Inst.C.E.

WATER AND SANITARY AFFAIRS.

THE amendments proposed by Lord Hugh Cecil to the Government Bill on the Metropolitan Water Companies were disposed of in Committee of the House of Commons on Wednesday by majorities of 80 and 84. The long talk over these amendments delayed the progress of the Bill; the debate being cut short in the middle of the second clause by the arrival of the hour when, according to the rules of the House, progress had to be reported. The proposals brought forward by Lord Cecil were essentially extraneous to the Bill; and not only so, they were directed to a state of things which cannot be said to exist. If such enactments are necessary as these amendments would create, the London Water Companies must be guilty of extraordinary transgressions. It was proposed that a Company should be rendered liable to a penalty of ten pounds in the case of "every person" whose health had been endangered by some negligence of the Company in respect to the supply of water. If such negligence were proved, and the full penalty were inflicted, the result might be veritable confiscation. Purchase would thus be superseded by a seizure in default. Of course, matters would not go so far as this. The penalty per head might be reduced to a shilling, which would be quite serious enough, if reckoned on the basis of a population like that of the East London or the New River Company's district, or any considerable portion thereof. But where has there been negligence, such as would call for exemplary vengeance of this kind? Causes come into operation which are beyond human control, as in the case of extraordinary drought or frost. Vegetation or fish-spawn may obstruct the action of the filter-beds, and no one could foresee the event. The worst results have flowed, not from any negligence on the part of the Companies, but from what may be called interference through the action of Parliament or the County Council; and we are not sure that danger from such sources is yet at an end, though East London is at last safe, in virtue of its big reservoirs. Strange notions circulate in Parliament; and they found expression in last week's debate. One of Lord Cecil's amendments proposed pecuniary damages where health was injured or endangered, or where any annoyance or inconvenience was occasioned. This was resisted by the Government as superfluous; the general law already providing a remedy. Mr. Chaplin stood firm, and the Bill was allowed to retain its original character, so far as the House dealt with it; and it is to be hoped that this will be the case throughout.

Had the amendments moved by Lord Cecil in respect to the Government Water Bill been carried, the Companies might have been put to considerable trouble and expense in defending themselves before the Railway and Canal Commissioners; but it is quite likely that this would have been the only result. The huge evils which the mover of the amendments sought to guard against existed nowhere but in his own imagination; or, if in existence at all, they were provided against by Acts already passed. The merit claimed for the Government Bill was that it furnished more ready means for bringing these Acts into operation. To make the existing law effective was the object aimed at. Supposing real cause of complaint to arise at any time, the consumer, if the Bill passes, will know his remedy, and will find it near at hand. The Companies are evidently willing that the consumer should have this advantage; and the probability is that the Government Bill, if it receives the sanction of the Legislature, will show how little reason the public have to complain of the service rendered by the London Water Companies. One thing to be regretted in connection with the recent debate is that so considerable a number of members—the minority being rather more than a hundred—were found to vote in support of Lord Cecil's preposterous amendments. Had these been carried, they would probably have been seized upon by the County Council as lowering the value of the undertakings, seeing that the Companies were rendered liable to such tremendous penalties. Are the Council prepared, if they obtain the water supply, to be placed under similar obligations?

The report of the Water Committee which came under the consideration of the County Council last week, relative to the Royal Commission, contained a passage particularly vehement in its opposition to the Water Companies. It was declared to be quite clear that "the irresponsible "position" occupied by the existing Companies cannot

continue; and if purchase does not take place, Parliament will be asked to "materially cut down the powers of "rating, to limit the dividends, and generally to revise the "whole of the existing financial arrangements." This looks very much like managing the entire business, especially as at the same time the Companies are to be placed "under much stricter obligations to supply pure water and "to provide adequately for the future needs of the Metro-"politan water area." This reference to the "future "needs" is scarcely in harmony with the constant efforts of the Council to prevent the Companies from making any adequate provision beyond the present hour. Concerning the report, 40 members voted against its reception, but 57 supported it. As for the resolutions which were appended to the report, and which the Council were recommended to adopt, the first was that, in the opinion of the Council, the water supply of the Metropolis should not continue in the hands of private Companies. To this Alderman Beachcroft moved an amendment that, in view of the reference to the Royal Commission, it was undesirable for the Council to pass any further resolutions affecting the acquisition of the water supply of the Metropolis. The amendment was lost by a majority of 19; but, looking at these numbers, it may well be asked what weight can attach to any representation made to the Royal Commissioners as expressing the views of the Council on the Water Question? Lord Onslow hoped that, whatever decision the Council arrived at, the Commission would have too much sense to give any credit to it. So far as any decision is concerned, the Council arrived at none last week; the debate dragging on without result until it was adjourned in obedience to Standing Orders. The Commissioners are waiting for evidence from the Council; but who are to be the witnesses? Whoever they may be, the string of resolutions proposed by the Water Committee are intended as the basis of their evidence. This will simply be from the Progressive point of view. Will the Moderates also offer themselves as witnesses?

According to an "urgency" report from the Water Committee, which comes before the County Council to-day, the Commissioners select for the present two points of evidence from the list of seven submitted by the Committee. The two selected are: "The special features of the present "water supply of London," and "the financial position of the "eight Metropolitan Water Companies, and the financial "aspect of purchase by a public authority." These points, being the third and fifth on the Committee's list, are to come on in the first place. The witnesses the Committee propose to offer to the Commissioners on this part of the subject are Sir A. R. Binnie, Mr. H. L. Cripps, Mr. G. L. Gomme, and the Comptroller, Mr. H. E. Haward.

The Index to Vol. LXIX. of the "Journal," January to June, 1897, is now ready; and a copy will be forwarded (post free) by the Publisher, on receipt of a post-card from any Subscriber.

The Litigation as to the Rawson Patent.—The trial of the action of the Sunlight Incandescent Gas-Lamp Company, Limited, against the Incandescent Gas-Light Company, Limited, which refers to the alleged infringement by the defendants of the Rawson patent for stiffening the mantles of incandescent gas-burners, was begun yesterday before Mr. Justice Wills, sitting without a jury.

The Dividend of The Gaslight and Coke Company.—We learn from the Secretary and General Manager of The Gaslight and Coke Company (Mr. J. W. Field) that the accounts for the past half year show that (subject to audit) the balance to the credit of the net revenue account is £366,552, which, together with £9354 to be withdrawn from the reserve fund, will enable the Directors to recommend the payment of a dividend at the statutory rate of 12¾ per cent. per annum. This time last year the balance was £474,710; and after the payment of a dividend at the above rate, there remained £108,897 to carry forward; while in February last the balance was £417,934, and, with the same dividend, there was a sum of £45,747 to the good.

Memorial of the Late Mr. Denny Lane.—Our readers may remember that shortly after the death of Mr. Denny Lane, on Nov. 29, 1895, a Committee was formed, as the result of a public meeting, to testify in some permanent way the appreciation of the citizens of Cork of his worth and life-work. It was determined that the memorial should take the form of a bust; and its execution was entrusted to Mr. Murphy, a native of the city to which Mr. Lane had devoted so much service. The bust has been placed in the Crawford Municipal Schools of Science and Art, and it was unveiled last Tuesday by Mr. T. Crosbie, the Chairman of the General Committee of the Schools, who spoke eloquently of the many excellent qualities of him whose memory it was intended to perpetuate.

ESSAYS, COMMENTARIES, AND REVIEWS.

GAS AND WATER COMPANIES IN THE STOCK MARKET.

(For Stock and Share List, see p. 182.)

THINGS on the Stock Exchange took a decided change for the better last week. It is true that business was very quiet, owing to the large number of absentees; Henley being one of the most potent counter-attractions to Capel Court. But despite the paucity of attendance, the general tendency was excellent; and firmness was the characteristic throughout the list. The prices of pretty well everything have therefore improved; rails being conspicuous in the van. There is nothing to note in the Money Market; and the Stock Exchange settlement was too light to have any effect upon it. Business in Gas remained rather quiet until towards the close of the week, when dealing became pretty active, especially in Gaslight "A" and Imperial Continental. The former hovered for some time at about the closing figures of the previous week, and not too firm at them, until the dividend announcement came out. Transactions then took a wider range, according as the point of view was satisfaction at the maintenance of the former rate of dividend, or dissatisfaction at the drain on the reserve fund to maintain it. Reserve funds were, of course, created for the express purpose of maintaining dividend rates. But they will not last for ever; and the continued declaration of a 12¾ per cent. rate when not 11 per cent. has been earned will demolish reserves in time. The question, then, for consideration is, Which will first happen—such a demolition, or such a run of prosperity as will build up the reserve again out of surplus earnings? Each one must answer this question for himself; and meanwhile the quotation of Gaslight "A" stands unchanged. The secured issues were in great form, and scored some notable advances. There was more business in South Metropolitan; and the price rose another point. Commercial debenture was in demand at better figures; but the capital stocks were not touched. A few dealings took place in Suburbans and Provincials, but nothing calling for notice. In Continentals, Imperial, after hanging fire, had a smart advance, and closed strong. European also improved; and Cagliari advanced *ex div.* None of the rest made any move, except Buenos Ayres—sellers wanting half a point more. The Water Companies were very quiet, but firm; and one or two small advances in price were effected.

The daily operations were: Business in Gas was rather quiet on Monday; but prices ruled firm. Gaslight 4½ per cent. debenture rose 4; and Commercial ditto, 2½. There was a little more activity on Tuesday, coupled with continued strength. Gaslight 10 per cents. moved up 3; and Buenos Ayres, ¼. Business became quieter again on Wednesday; but the tone was good. Imperial improved 2; Gaslight "B," 1; and European, ½. Thursday brought a better promise of activity; but the only change in Gas was a rise of 1 in Imperial. Lambeth Water rose 2. On Friday, there was much dealing in Gaslight "A" and Imperial; and the latter rose 3. South Metropolitan gained 1. In Water, Lambeth and Grand Junction rose 1 each. Saturday was somewhat busier than usual; the prices closing steady and unchanged.

ELECTRIC LIGHTING MEMORANDA.

The Report of the Dangerous Trades Committee on Electrical Generating Works—Municipalities Seek to be Excused—Electricity Generation always Dangerous—Treatment of Sufferers from Electrical Shock.

THE second interim report of the Departmental Committee appointed to inquire into and report upon certain miscellaneous dangerous trades, has been printed. It deals exclusively with electrical generating works, the inclusion of which within the reference to the Committee was at the outset injudiciously ridiculed by a portion of the electrical press. This perfunctory ridicule has long since died away, in face of the numerous proofs that have accumulated during the past two years to show that the generation and distribution of electricity for lighting and power purposes is anything but an innocuous performance. It is to be easily understood, however, that it has not been an easy task for the Committee to bring electrical generating works within the scope of their general instructions; and they must have been very glad of the assistance of Mr. C. V. Boys, who was joined to the Committee in February last for the special purpose of helping on this branch of the inquiry. Another difficulty seems to have arisen at the outset from the circumstance that electrical generating works are under the control of the Board of Trade, while this Committee derived authority only from the Home Office. Consultations between the two Departments have taken place, however, with the result that "the Committee believe that completely harmonious working can be achieved with the least amount of difficulty by the application of the recommendations which follow at the end of this report to all generating stations and transformer stations

into which one or more persons can enter, and that cables or wires outside such stations or chambers should remain, as now, the care of the Board of Trade."

The Committee are further of opinion that these recommendations should be applied to all stations and transformer chambers, exclusive only of private houses and premises. It has been suggested to them that "where corporations or public bodies carry on a generating supply for the public good, such cases might not be considered to come within the scope of the mischief aimed at." The last words of this passage are a little obscure; but its general purport is unmistakable, and indicates that here again municipalism has endeavoured to get relief from the ordinary restrictions and obligations, sometimes onerous enough, which are thought to be desirable in the case of private undertakers. Happily, the Committee have been proof against this insidious plea; considering it "equally important to safeguard the lives of the workers, whether they be employed by individuals, urban corporations, or other public bodies." There is a smack of rhodomontade about this declaration; but it must be acknowledged that something may very well be allowed for the counter-effect of the representations that must have been made to the Committee from more or less "influential" quarters, in the interest of municipalities.

The Committee have been confronted with another kind of difficulty in the great diversity of system to be found in different generating stations. In addition to this, it is plainly impossible to foresee every accidental combination of circumstances which might lead to serious risk. In face of this uncertainty, the Committee have been fain to fall back upon the general statement that "the accidents which have occurred are those which are most likely to occur." These have indicated the lines along which preventive measures may be most profitably disposed, though the Committee "would desire to record it as their opinion that the dangers from electric shock in the generation and distribution of high-pressure currents can never be entirely obviated." Owing to the great and rapid growth of the electrical industries, any preventive measures that can be devised now must be regarded as tentative. At the same time, the Committee emphasize their opinion "that it is of the greatest possible importance that the workpeople in electrical generating works and sub-stations should be protected by every reasonable precaution from the grave dangers inherent in these operations." That protective measures, however tentative, are necessary, is a presumption confirmed by the fact that "in the last five years fourteen fatal accidents have occurred, including five since the appointment of the Committee." While careful to disclaim finality for their proposals, the Committee declare that these are framed with an earnest desire to prevent a recurrence of the "deplorable fatalities which have occurred in the past, with the strong conviction that without these or similar requirements, no efficient protection for the lives of the workpeople can be afforded, and with the full belief that the occupiers and employors in this industry, while finding no insuperable difficulty in carrying them out, will be grateful for the relief from responsibility which their acceptance and execution will accord." The Committee gratefully acknowledge the assistance they have freely received, in framing their recommendations, from a number of eminent men of science and practical electric lighting engineers.

The report gives some valuable information, carefully expressed in non-technical language, concerning the methods in use for generating and distributing electricity. The different systems are classified as low pressure, which is always direct; high pressure, which may be either direct or alternating; and extra high pressure, of which the only example in this country is the Deptford undertaking. The peculiar risks attending the work of electrical generating and distributing stations are then described at considerable length. It is observed that "the effects of the passage of an electric current through the human body are extremely uncertain and variable." Thus while the pressure required to cause death has in America been fixed at 1500 volts, evidence exists to prove that a smaller pressure will kill under favourable conditions. On the other hand, people are known to have endured shocks at higher pressures without any serious consequences following. The best known treatment for persons suffering from electrical shock is by artificial respiration, some information respecting which method of resuscitating the apparently killed was furnished to the Committee by the "Electrical Review."

It would be out of place here to enumerate or discuss the specific recommendations of the Committee. The report must imperatively be in the hands of everybody who may be responsible in any degree for the administration or management of electrical generating works. Several of the recommendations are of a sweeping character, and will necessitate in many instances expensive alterations of existing plant. With regard to the measures indicated as applicable for the restorative treatment of persons suffering from electrical shock, it is very desirable that all employees in generating stations should be not only familiar with the procedure, but should also be exercised in it at frequent intervals; for fright is as fatal a thing as electricity itself. An appendix to the report records the fatal accidents from electric shock in the last five years in the United Kingdom. It is a terrible list; the facts being rendered more impressive by the apparent triviality of some of the operations that proved so unexpectedly disastrous.

THE REFORM OF GAS-WORKS RATING.

Very little public notice has been taken of the proceedings of the Royal Commission on Local Taxation, which have not as a matter of fact been reported in the newspapers. The admission of reporters to the meetings of Royal Commissions is a matter for the Commission to determine in every case; and it has probably been considered that an inquiry into local taxation methods is not likely to provide interesting reading for the general public. It is unnecessary to show how extremely interesting the same kind of matter is for the administrators of gas and water undertakings; and we have accordingly taken steps to procure information respecting the manner in which the case of this class of hereditaments has been presented to the Commission.

Evidence in this regard was given by Mr. H. E. Jones and Mr. George Livesey, Mr. Crowther Smith, the Secretary of the Southampton Gas Company, and Mr. H. Wilkins, the Secretary of the Lambeth Water Company. All the witnesses agreed in denouncing the absurdity of, and showing the practical objections to, the "hypothetical tenant" principle of assessing gas and similar undertakings. It was easily demonstrated that this principle works to the peculiar disadvantage of gas undertakings, and also that it lends itself to great abuses. The whole system of quinquennial valuations was explained to the Commission; and it was shown by specific examples how the object of the Act that provided for these periodical revisions—the saving of trouble and expense to both parties in arriving at a just estimate of the rateable value of the hereditament—is defeated by the practice that has grown up in the application of the law. So far as could be observed, the Commissioners as a body, seemed to accept the proposition that the hypothetical tenant has become a nuisance in regard to the valuing of gas undertakings; and they were disposed to look favourably on any suggestion for a more certain method of attaining the desired object. Upon this head the witnesses named had a variety of plans to offer for the consideration of the Commission; for it was obvious that the old system, whatever its abuses, must hold the field until a better can be found to put in its place. Reform may be with relation either to the principle or the system.

Mr. H. E. Jones advocated the Scotch system, which has the advantage of not requiring any alteration of the principle of valuation. Under this system, an independent professional assessor makes his own valuation, without having any personal pecuniary interest in the result. The arrangement is described at length in Sir James Bell and James Paton's "Glasgow," p. 58, already noticed in our columns. Here it may be read how the duty of preparing the annual valuation roll, on which is reared "the bulk of the financial fabric of the city," is laid upon the City Assessor, under the Lands Valuation Act, 1854. The new roll has to be completed by Aug. 15; and by Aug. 25 every ratepayer in the city has received a copy of the entry relating to himself. "Special conditions attach to the valuation of railways and canals, and gas and water undertakings, returns of which are made by a separate assessor." It is the office of this special assessor which Mr. Jones would see reproduced for all gas undertakings, especially those of the Metropolis, with power of appeal to the High Court instead of to Quarter Sessions. This reform would obviously remove much of the objectionable character of the existing system, and better carry out the spirit of the general law. It would give the hypothetical tenant a fairer chance, and abolish the ever-recurring costly squabbles on appeal over his imaginary requirements and risks.

Mr. Livesey, while supporting Mr. Jones up to the point of holding the Scotch system to be vastly better than the English one, was in favour of taking the opportunity for getting rid of the hypothetical tenant altogether. He argued that the reason for bringing in this legal fiction could only be in order to ascertain what rent a gas undertaking would command; and he denied that the desired end can be attained with any approach to accuracy by this means. He pointed out that the position of gas undertakings in regard to rating is unique, inasmuch as the charge for rates does not come out of the pockets of the proprietors by way of diminution of their profits, but is transferred directly to the consumers. A minor, but yet important point is that the present system of assessment does not make proper allowance for the position of gas undertakings as manufacturing traders. It is assumed that the entire profits result from the sale of gas, and none whatever from the sale of residual products. The profits on the latter have nothing to do with the so-called productive mains; yet the assessment of the mains benefits from the manufacturing returns.

Mr. Wilkins has a suggestion, which he submitted to Mr. Livesey, who recognized that it possesses several advantages. This is for a sliding-scale, based on the proportion borne by divisible profits to capital expenditure. If the divisible profits do not exceed 1 per cent. on the capital expended, then the rateable value is to be taken at 3 per cent. of the capital expenditure; the ratio increasing by ¼ per cent. rateable for every additional 1 per cent. of profits. Of course, the starting-point is everything in such an arrangement. Tested by application to a number of gas companies, this scale makes the rateable value equal to about one-half of the divisible profits; which is nearly the same as the present average. The plan has the virtue of extreme simplicity. But Mr. Wilkins safeguards his

proposal from the complication of stock-consolidation schemes, such as that by which the capital of the South Metropolitan Gas Company was doubled in 1896, by explicitly stating that actual capital expenditure only is to be taken into calculation. In some cases it would be necessary to obtain a statutory declaration of the true amount of the capital expenditure.

Mr. Livesey finds that actually, where gas undertakings have a high capital, the price of gas is likewise high. One company, for example, can pay interest and dividend with a charge of 9d. per 1000 cubic feet; while another requires 1s. 3d. per 1000 cubic feet to pay the same rate of interest and dividend. The latter concern, however, appears to be making a larger profit than the former, and is rated higher in consequence. Thus the consumers have to pay more for rates because their gas is dearer—which, as Euclid would observe, is absurd. Yet it is the fact. Upon this Mr. Livesey suggests that, seeing that the final result of all rating assessments is a charge upon the consumer of so much per 1000 cubic feet of gas, a short cut might be made direct from the rating authority to the consumer by fixing the charge for rates at so much per 1000 cubic feet of gas sold. He proposes that a technical Board, composed of a judge or barrister having extensive rating experience, a rating surveyor, and a gas engineer, should ascertain what this charg should be, once for all or from time to time. The basis of the commutation would be found in the returns of a sufficient number of gas undertakings over a term of years. At present the burden is very unequally distributed; some consumers paying 3¼d. per 1000 cubic feet in rates, while others are let off with ¾d. per 1000 cubic feet. Both cannot be fair; and, as already observed, the inequality presses most heavily on consumers who have already to pay for a heavy capital outlay.

Mr. Livesey has worked out his plan in some detail, and the result has been circulated rather freely among gas companies. He suggests that the datum should be a 5s. rate, and 1d. per 1000 cubic of feet of gas sold. This would be the minimum contribution of the gas undertaking to the rating authority of the district in which it does business. For every addition to the rates of 3d. above the standard of 5s. in the pound, there should be a corresponding rise of $\frac{1}{10}$d. per 1000 cubic feet of gas sold. This would make a 7s. 6d. rate equivalent to a charge of 1½d. per 1000 cubic feet of gas sold. This is confessedly an empiric datum. Upon the assumption that the assessment should be based on a ratio between the divisible profits and the total capital, whatever this may be, the first thing to be settled is the amount per 1000 cubic feet required to pay the authorized dividend and interest. Let this be taken at 10d. Then, still assuming that 1d. per 1000 cubic feet is the proper gas contribution to the rates when they are 5s. in the pound, for every 1d. more or less than 10d. required to pay the authorized dividend and interest, $\frac{1}{10}$d. would be added to, or subtracted from, the 1d. per 1000 cubic feet payable to the rate fund. Thus, if 9d. be the figure, then $\frac{9}{10}$d., or 0·9d., will be the contribution to the rates; if the figure be 11d., then $1\frac{1}{10}$d., or 1·1d. will go to the rates, and so on. The proper figure being ascertained, the next step is that of adjusting for variations in the poundage of the rates. For every 3d. above or below 5s. in the pound, $\frac{1}{20}$d. is to be added to, or taken off, the ascertained figure. Supposing the figure to be 0·9d., and the total amount £9000 with a 5s. rate, then for every 3d. up or down 1-20th part of the £9000 would be added to, or subtracted from it.

Another plan suggested is to take the half of the income-tax assessment as the rateable value. This again would work out about equal to the actual figures for companies; but it would give an advantage to the municipal undertakings. Obviously, legislation would be necessary to give effect to any of these plans; but the reform in any case would be great, as there is not one of the suggested systems but would show the rateable value of an undertaking annually in a few minutes.

We have put these observations on record as indicating the various ways in which experienced professional men—not rating surveyors—propose to rearrange the rating system of the country in regard to gas undertakings. If the much-abused rating surveyors can show cause why they should not be disestablished in these ways, or any of them, we shall be glad to receive their evidence on the point. If gas managers also will take the trouble to test the proposed systems upon their own cases, the results may be instructive. The great *desideratum* is a system that will cover the greatest number of examples with the least risk of error. The hypothetical tenant has the rare merit, such as it is, of being prepared to go into any sort of business, and work everything on the same lines. This catholicity of commercial instinct, it is alleged, has led to the perpetration of a number of anomalies by surveyors acting in his name; and the only question is how these are to be removed.

Association of Municipal and County Engineers.—The annual meeting of this Association opened at Westminster on Thursday, the 8th inst., under the presidency of Sir A. R. Binnie, Engineer of the London County Council. In his Inaugural Address, he gave an historical sketch of the growth, progress, and government of London, and dealt with the institution and work of the London County Council. With reference to local government, he expressed the opinion that a great deal of energy was wasted in the useless discussion of professional details. In the evening the members dined together at the Trocadero Restaurant.

A PAGE IN THE HISTORY OF GAS LIGHTING.

In connection with the Victorian Exhibition at the Crystal Palace, there is a businesslike Gas Section, which was described generally in the "Journal" for the 22nd ult. At that time, the exhibitors had not in all cases completed their arrangements; but this has now been done, and those who are interested in the subject of gas-consuming appliances can inspect at the various stalls everything worth seeing in the latest developments of gas lighting, burners, and stoves. As we observed on the previous occasion, it is no part of our duty to discriminate between the meritorious exhibits of the makers of gas apparatus represented here; but, in fairness to them all, we draw the attention of our readers to the show, and repeat the assurance that the collection of appliances as a whole is one of which the British gas industry need not be ashamed. Every exhibit bears testimony to the continuous endeavours of the manufacturers of this class of goods to satisfy the requirements of the public and the suppliers of gas. There is not a stand but possesses some speciality designed to "meet a long-felt want;" and it is difficult to see how the existing types of gas apparatus can be much further improved. The Gas Section of the exhibition is small in comparison with the collections of gas apparatus that have been seen before at the Crystal Palace. It could have been made much larger without any difficulty; but what there is is of the very best. There are no novelties of a startling character in it; but everything shown is a sound merchantable article, proved to be capable of playing its part in connection with the remarkable modern extension of the use of coal gas by the community.

Perhaps the most notable addition to the exhibits that has been made since our last visit is the combined gas and steam cooking apparatus used with such success by Messrs. W. Sugg and Co., as already recorded, at the last Military Tournament at the Agricultural Hall. This arrangement is likely to answer well where catering on a wholesale scale has to be done with economy and celerity. It should also be recorded that, after all this delay, an electric cooking-oven has been got to work, and actually turns out a baking of small cakes every day which are sold as "curios." The electrical exhibits as a whole, however, are being done in a half-hearted way which does not tend to enhance the cheerfulness of the section.

It was stated in our last notice that a special article would be devoted to a description of the objects of historical interest shown by the South Metropolitan Gas Company. We now proceed to redeem this promise. The idea that the Company should help the Crystal Palace Company in getting up the Gas Section was a good one; and the participation of Mr. Charles Howard, the Company's Chief Inspector, in the business is doubtless the reason why the collection of every-day, working gas apparatus is so good and representative. Mr. Frank Livesey, the Chief Engineer of the Company, has also taken a great interest in the historical part of their show, which goes back to the half-forgotten epoch of the London Portable Gas Company, who flourished, as the history books say, at the commencement of the Queen's reign. The necessary link between the present and this—for the gas industry—remote past is supplied by the living personality of Mr. Frederick Hazeldine, whose father took on the business of the Company, and carried it on for some time at his works, in Great Sutton Street, Clerkenwell.

One of the original prospectuses of the London Portable Gas Company has been preserved; and we reproduce it below. It should be explained that, though called "oil gas," the commodity was really made by carbonizing rosin. The price to be charged for this gas is to be carefully noted, and also the comparative prices of candles, and of the oil gas "delivered through pipes" by the Company at Bow. The prospectus runs as follows:—

LONDON PORTABLE GAS COMPANY.

Proposals for Establishing, and Plan of a Portable Gas Company, to Supply Houses, Carriages, and Shops with Compressed Oil Gas, in such Large or Small Vessels as may be Commodious and Easily Carried from Place to Place. The Gas to be Delivered at Houses in Vessels Ready to Light, something after the manner Milk and Beer are Distributed.

1.—The capital to be £50,000, divided into shares of £100 each; and the proprietors to have a vote in the management of the concern for each share he or she may possess.

2.—Ten per cent. only to be demanded until the proprietors have all an opportunity to be convinced, by the evidence of experience, of the benefits and profitableness of the concern; and each shareholder thereafter to have leave to withdraw from, or sell his or her share in, the concern.

3.—Subscribers of ten shares to have the option at any time before the day of payment, which may be appointed for the second instalment, to turn their ten shares into one share of £100, which share will thus have been paid up in full.

By these clauses, subscribers for ten shares will have the advantage, after the profitableness of the concern is ascertained, either to hold one or ten shares as they may choose.

4.—The concern to be managed by seven Directors (three of whom to form a quorum), a Secretary, Engineer, and Clerk. The patentee of the portable gas-lamp offers to act for a time as Secretary as well as Engineer, and will stipulate for no fixed salary, but leave that to be decided upon by the Directors after the profits are ascertained.

5.—The houses, &c., of subscribers to be supplied with gas in preference to others.

6.—No article to be purchased for the Company on credit, and no gas to be sold on credit; but persons desirous to have gas to purchase tickets for a quantity of gas, and those tickets to be returned as the gas is supplied.

7.—Subscribers paying their whole subscription at once to draw dividends on the full amount thereof.

Three Thousand Pounds, or 10 per cent. on 300 shares, is calculated, as per estimate, to be fully sufficient to rent premises, erect gas apparatus, steam-engine, pumps, reservoirs, and carriages to distribute 6000 cubic feet of oil gas per day (which in giving light is more than equal to 600 lbs. of candles), and also to purchase 100 to 200 lamps to sell to applicants.

It is proposed that the oil gas when delivered in small quantities to be sold at the rate of 100s. the 1000 cubic feet, and in large quantities—viz., of 20 cubic feet and upwards, at 60s. per ditto. And thus, even at the highest rate, a gas light (certainly more beautiful and clean than even wax) could be obtained at the price of a tallow candle, and in a mode which prevents the possibility of smell or danger of explosion.

	£	s	d
10 feet of gas give more than the light of 1 lb. of wax or mould candles, and will cost, at 60s. per 1000 cubic feet	0	0	7½
10 feet of ditto at 100s. per ditto, will cost	0	1	0
Cost of a 6-inch sphere sufficiently neat to be used with a covering case	2	8	0
Cost of such quite plain, and intended to be put into an ornamental case, 25s. to 30s.—say	1	10	0
N.B.—These would each contain 2 feet of gas, which would give for eight hours a light equal to a wax candle five to the pound, and the cost of the gas contained therein, at 100s. per 1000 cubic feet, would be 2⅜d., and at 60s. would be under 1½d.			
Cost of a plain 9-inch sphere, to contain 6½ feet of gas, suitable for a small dinner party, and giving for six hours a light superior to four wax candles	2	2	0
Cost of gas for ditto, at 100s. per 1000 cubic feet	0	0	7⅛
Cost of ditto for ditto at 60s.	0	0	4 7/10
Cost of a 12-inch sphere, to contain 15½ feet of gas, suitable for a large dinner table or drawing-room, and equal to 12 wax candles for eight hours	3	3	0
Cost of gas for ditto, at 100s. per 1000 cubic feet	0	1	6 6/10
Cost of ditto for ditto at 60s.	0	0	11 7/10
N.B.—There will, on examination appear some discrepancies in these calculations, which arise from the circumstances that a large united body of flame is found to have more illuminating power than a number of smaller flames, although the quantity of gas consumed may be equal.			

Oil gas, being free from sulphur, cannot injure plated goods, pictures, or furniture.

One pound of wax candles costs from 3s. 10d. to 4s.; one pound of mould tallow candles costs from 8d. to 1s.

The present Oil Gas Company of Bow charge for gas delivered through pipes at the rate of 50s. per 1000 cubic feet. It is thought that, when it shall be delivered in portable shape, 60s. will be considered fully more beneficial to consumers, as, first, from its being portable, less light in an apartment will generally be required; secondly, a consumer shall have to pay for what is used only; and, thirdly, a consumer can economize at discretion, and use fewer or more lights as may be required. Also gas, when it is portable, can be used in many places where it is not at present conveyed, and in situations where it is impossible in any other manner to convey it or use it.

When Mr. George Hazeldine took the business, he issued the following circular:—

PORTABLE GAS AT A REDUCED RATE.

The present Proprietor having taken the works and premises of the Company, is enabled to offer the portable gas to the public at a reduced rate; and from its excellent quality, the public will now find portable gas to be one of the most economical and clean lights they can use. Those gentlemen who have the managing of parish churches, chapels, schools, &c., within 12 miles of London, are particularly recommended to try portable gas; and those who have heretofore used the street or coal gas can have the portable gas attached to the old pipes at a very trifling expense.

The advantages of portable gas in Gordon's patent lamps are: Its great illuminating power: that, being made from oil and free from sulphuretted hydrogen, it cannot injure metallic goods, pictures, elegant bindings of books, or gilded furniture of any description; that it gives out, when burning, only about half the heat of coal gas; that no sparks, and no dirt or greasy matter, can fall from the lamps.

From the safety, cleanness, and economy of oil gas, it is found peculiarly adapted for noblemen's and gentlemen's dwelling-houses, and generally for domestic purposes; for all manufactories, for milliners, dressmakers, warehouses, counting-houses, taverns, billiard rooms, shops, &c., &c. For all the various purposes for which oil, tallow, and wax lights are now used, the gas is constantly used, and also for many of the largest and most elegant public places, churches, chapels, and societies in London and its neighbourhood.

No explosive mixture can be formed by an escape of gas from the portable-gas lamps, because to produce such a much greater quantity of gas would be necessary than the whole supply required for one place, even supposing all the gas in the reservoirs to be at once purposely liberated. Among the many thousand portable gas lamps constantly in use in London, no accident has ever occurred.

Each new customer must pay in advance for a given quantity of gas—not less than 600 feet—to be delivered from time to time, as may be required, in such lamps as shall be selected, at the rate of *seven shillings per* 100 *cubic feet*. As the consumer only pays for the gas he consumes, it is in his power to economize by using more or less gas as business may require.

The customer will be liable for damage done to the lamps by misusage or negligence while in his possession, and for the safe return to the works within ten days after he shall have ceased to use the gas.

All orders to be addressed to Mr. George Hazeldine, Portable Gas-Works, Great Sutton Street, Clerkenwell, who will, if necessary, cause some person to call upon the party to explain more fully.

Routs and balls supplied with oil gas in handsome tripods, &c.

Scale of Sizes of Lamps, showing the Quantity of Gas contained in each.

Cylinders.	Feet of Gas.	Cylinders.	Feet of Gas.
6 in. by 21 in.	10	12 in. by 24 in.	38
6 in. by 30 in.	13	12 in. by 36 in.	61
6 in. by 36 in.	16	12 in. by 48 in.	84
6 in. by 48 in.	22	12 in. by 54 in.	95
9 in. by 21 in.	19		
9 in. by 48 in.	48	*Spheres*	
9 in. by 63 in.	64	12 in. in diameter.	

*** Noblemen and gentlemen who reside within 15 miles of the town may have their lawns and carriage ways lighted up with portable gas for the night only, at a very trifling expense.

It will be noticed that by this time the competition of the portable gas had come to be with coal gas distributed through street mains. An extensive business was transacted in these cylinders and spheres charged with rosin gas under pressure. One of the cylinders and a sphere are shown at the Crystal Palace. The former is of the same general shape as a modern compressed gas cylinder, and measures 4 ft. by 7 in., outside. It weighs only 19 lbs., being made of thin charcoal iron, brazed. The accompanying sphere, which is 12 inches in diameter, is of similar make. These receptacles were always tested to 30 atmospheres before leaving the makers' hands. The cylinder shown was tested and found still tight under 24 atmospheres so late as 1875. Gas was sent out compressed to 14 atmospheres in the spheres. To show the extent of the business that was done at one time by Mr. Hazeldine, it is stated that he had more than 10,000 of these spheres and cylinders in service, and never had an accident due to any weakness of the containers or fittings. A cylinder used for lighting the works of Brunel's Thames Tunnel dropped upon a workman's pick, which went through the thin metal and the escaping gas ignited; but this was the worst mishap of the kind recorded. Somebody would have something to say nowadays if illuminating gas were compressed to 14 atmospheres, and sent out in vessels of this construction and lightness; but nobody troubled about such matters in 1837.

Another curiosity lent by Mr. Hazeldine is a swing gas-bracket with hydraulic joint, used in the oil-gas factory. This fitting has a cock of the ordinary construction; but instead of carrying out the same idea of the cock plug for making the swivel joint, this is a hydraulic seal, about 3½ inches deep. As the rosin gas left a viscid deposit, the seal worked with perfect safety. That such a construction should ever have been favoured by mechanics who were possessed of sufficient skill to make a sound cock, is a striking illustration of the limitations which the human mind imposes upon itself when confronted with unfamiliar necessities.

It is to be supposed that the South Metropolitan Gas Company have not preserved many archives of interest relating to the early days of gas lighting in South London; at any rate, none is shown. A place of honour is reserved for an illustrated blank bill-head of one "Thos. Edge, gas fitter to the Chartered Gas Light and Coke Company," which bears the imperfect date 181—; thus proving that there were gas-fitters, and registered ones at that, in business in London during the first decade of the century. The blank form would have been more interesting still if it had contained a regularly priced-out account for gas-fitting of the period. The Company show models, to a uniform scale, of three of their gasholders, the size of which illustrates the growth of gas consumption in the district during the past sixty years. The first is a single-lift, central-pillar guided holder, 50 ft. by 16 ft., which was one of the largest in London at the time. Next is the oldest of the Company's holders in actual use. It dates from 1850, and is 100 ft. by 38 ft. telescopic. The largest is the biggest Kent Road holder, 210 ft. by 160 ft. The rest of the Company's exhibit is made up of specimens of products made by Messrs. Forbes, Abbott, and Lennard from tar; by Messrs. H. Button and Co. (prussiate of potash, and blue) from the spent oxide; and by the Company themselves (prussiate of soda crystals, and sulphur) from their own processes. Mechanical stoking, prepayment meters, and improved street lighting are also illustrated at this stall. Mr. Livesey speaks well of Talbot's patent for an outside flash-light as applied to incandescent street-lamps. The patentee is one of the Company's street-lighting inspectors. To satisfy possible curiosity, it may as well be stated that the Company do *not* exhibit a profit-sharing employee, to say nothing of a workman-director! Mr. Howard has done his best with the materials at command; but a freer hand, backed up with a little more money, and inspired by a livelier imagination, would easily have made a more brilliant and convincing display illustrative of the past and present of a great Metropolitan Gas Company. Perhaps the Company prefer to contemplate the future, rather than draw attention to the past.

The impression one derives from this show as a whole is that the gas industry is well equipped with the means of conquering an increasing measure of popularity for many years to come, without going outside the well-recognized lines. Many things have happened since the gas engineering pilgrim was requested to bend his steps towards Sydenham for the historic Electric and Gas Exhibition of 1882-3. In some respects the present show is not to be compared with this earlier exhibition; but there is quite as much business in it, if not more.

OBITUARY.

The death is announced of Alderman E. BEARD, of Colchester, who was one of the Directors of the local Gas Company. He was 65 years of age.

We regret to learn of the death, at Brighton, of Mr. BLOTT, formerly Secretary of the Richmond (Surrey) Gas Company. Deceased had for some years been in receipt of a pension from the Company.

PERSONAL.

Mr. HENRY ROBERTS has been appointed Chairman of the Gomersal (near Leeds) Gas Company, in succession to the late Mr. Daniel Carter.

The Gas Committee of the Bolton Corporation have appointed Mr. J. SMITH as Assistant Gas Manager; the engagement to be for five years at an annual increasing salary.

The Water Engineer of the Richmond Corporation, Mr. W. G. PEIRCE, has had his salary raised by £50 per annum. Mr. Peirce is an old servant of the Corporation, and has not received any addition to his remuneration for several years, though he has been kept very busily engaged in connection with the work which has been carried out with the object of obtaining a supplementary supply of water.

Mr. A. R. BURCH has been appointed Manager of the Uxbridge and Hillingdon Gas Company, in succession to Mr. Septimus Penny, Assoc.M.Inst.C.E., whose resignation was announced in the "JOURNAL" a few weeks ago. Mr. Burch has been for the past nine years with the Commercial Gas Company. He was first a pupil of Mr. H. E. Jones, M.Inst.C.E., Engineer and General Manager; then he filled the position of Chief Draughtsman and Assistant; and latterly he has been District Superintendent.

Colonel S. A. SADLER, the popular Mayor of Middlesbrough has had conferred upon him the honorary freedom of the borough, "in recognition of the important and manifold services which he has rendered to the town during the past quarter of a century, and also as a mark of the high esteem in which he is held by the people of Middlesbrough." The resolution conferring the honour was passed, with much enthusiasm, at a meeting of the Council last Tuesday, after several highly complimentary speeches had been made by members representing the different parties in the chamber.

In our "Electric Lighting Memoranda" to-day, we notice the second interim report of the Home Office Committee on Dangerous Trades, of which Mr. Harold J. Tennant, M.P., is the Chairman. Acknowledgment is there made of the services rendered to the Committee by Mr. C. VERNON BOYS, F.R.S., who was specially selected early in the year to assist the Committee in their inquiry into the conditions of work as they affect the safety and health of the operatives in electrical generating stations. Our readers may remember that Mr. Boys is one of the Metropolitan Gas Referees; having been appointed in January last in succession to Professor A. W. Rücker.

Last Tuesday evening, the staff of the Portsmouth Water Company presented to Mr. R. W. FORD, who recently retired from the position of Secretary to the Company, a "Hampden" easy-chair, bearing the following inscription: "Presented to Richard Wm. Ford, Esq., by the Officers and Staff of the Borough of Portsmouth Water-Works Company, on his retirement as Secretary to the Company for forty years—1857 to 1897." Mr. Ford also received a photograph of the staff in a group. The presentation was made by Mr. H. R. Smith, Assoc. M.Inst.C.E., who commented upon the kindness shown by Mr. Ford towards all those in the service of the Company, and referred to his untiring energy and knowledge, which had done so much to place the water undertaking on its present firm basis. Mr. Ford expressed his thanks for the gift. He said he had always met with kindness from the staff, whom he had looked upon as friends; and this feeling of brotherhood had been conducive to the best interests of the Company.

In the "JOURNAL" last week we briefly recorded the fact that the will of the late Mr. C. C. WALKER, J.P., head of the firm of Messrs. C. & W. Walker, had been proved. After making certain personal and other bequests, the testator leaves the residue of his property to trustees, to pay the income thereof to Mrs. Walker during her life, or in the event of her re-marriage to pay to her an annuity for the remainder of her life. After her death or second marriage, the residuary estate is to go to the trustees or their successors and to the Chairman and Deputy-Chairman for the time being of the Salop County Council, who are to receive the proceeds upon trust to invest the same as authorized, and to apply the income as follows: (1) In the establishment of, or in or towards the maintenance of, any hospital, infirmary, convalescent home, or other institution having for its object the relief of sickness or promoting convalescence. (2) The provision of medical or surgical aid or appliances. (3) Any institution for the maintenance and education of orphans. (4) For the provision of such means of education as are not for the time being provided for by Imperial or local taxation. It seems probable that, after payment of the death and legacy duties, the amount of this reversionary bequest for charitable purposes will exceed £100,000.

NOTES.

Modern Steam Generation.

Some good information respecting both the technical and commercial sides of steam generation came out at the recent Manchester meeting of the Municipal Electrical Association. Two papers on the subject were read and discussed together. It was stated by Mr. John F. C. Snell, of Sunderland, that the Lancashire boiler takes 69 square feet of floor space, and costs erected £76 without, and £99 with, an economizer, per 1000 lbs. maximum evaporation. The water-tube boiler requires a floor space of only 34·4 square feet, and costs £96 erected per 1000 lbs. maximum evaporation. The former consideration is the chief recommendation, with quick steaming, of this type of boiler. The marine type of boiler is still more compact; requiring only 25 square feet of floor space, and costing £100 per 1000 lbs. evaporated, when not forced. Both these types of boiler cost more to clean, and are shorter lived than the Lancashire boiler. In Mr. Snell's opinion, feed water should be softened when naturally hard, and in every case heated. He expressed surprise that forced draught is not more generally used; and he regards this system, in combination with a good mechanical stoker, as a cure for the smoke nuisance. Mr. Steinitz, of West Ham, supported these observations. Mr. R. E. Crompton dwelt upon the advantage possessed by the water-tube boiler in standing a high degree of forcing. It was stated that Lancashire and Galloway boilers are now made for 200 lbs. pressure, which has once more placed them abreast of the water-tube boiler in regard to this important feature.

Coal Filters for Sewage.

At a recent meeting of the Midland District Branch of the Association of Municipal and County Engineers, Dr. G. Reid, Medical Officer of Health for Staffordshire, read a paper on artificial sewage filtration, with the object of calling attention to the virtues of a new filtering medium which has lately come into great favour in Staffordshire, and appears to excel all others in use. Dr. Reid referred doubtfully to the so-called "septic tank" principle of sewage treatment; and he praised the work of Mr. Dibdin upon coke-breeze filters as opening up new possibilities in sewage filtration. He then narrated how a year or two ago Mr. Garfield, the Manager of the sewage works at Wolverhampton, noticed the effect that a heap of coal slack appeared to have in purifying dirty water. This led him to try to purify Wolverhampton tank effluent by passing it through a small experimental filter of coal slack. The result was so encouraging that Mr. Garfield called in the assistance of Mr. Jones, the County Analyst; and the two have since been working the idea out with continued unqualified success. Dr. Reid heard of the experiments, and repeated the investigation for himself in connection with the sewage of an urban district so situated as to require artificial filtration for the effluent. A coal filter was accordingly constructed as follows; First, on the top of the drain-pipes is a 6-inch layer of ½-inch screened nut coal. This layer is blended with a layer of ¼-inch cube coal, above which comes 9 inches of ⅛-inch coal. Over this is 21 inches of $\frac{1}{16}$-inch coal particles; and the top layer is 2 feet of coal dust which has passed through a $\frac{3}{16}$-inch mesh—the fine dust not being removed as in the case of the other layers. The tank effluent is discharged continuously on to the filter for a period of twelve hours; thus allowing this period for aëration. One square yard of the filter will deal satisfactorily with 200 gallons of sewage per 24 hours. As compared with the Dibdin coke-breeze filter, this Garfield coal filter is claimed to be a considerable improvement. To the question as to whether the coal itself alters in composition under this treatment, no positive answer could be given. It could only be said that the coal appeared to offer a suitable medium for the growth of the nitrifying organisms.

Fire Office Rules for Lighting by Liquefied Acetylene.

It is reported that the Philadelphian Fire Underwriters' Association have gone further than any other fire insurance authorities in admitting the use of acetylene liquefied under pressure for lighting purposes. The Association have decided to permit the employment of this illuminant under certain conditions. It is provided that the pressure of acetylene gas in the piping inside the building to be assured must at no time be greater than ¼ lb. per square inch. The cylinder containing the liquefied gas under pressure, as well as all pressure-reducing and safety devices, must be located outside the building, and in a separate structure well ventilated to the outer air, but of sufficient strength to protect the apparatus from outside interference and from the weather (especially the sun's rays). The supply-pipe must be provided with a hand-valve just inside the building assured, so that the gas may be entirely shut off. It is also provided that the cylinder containing the liquefied gas under pressure shall be equipped with a safely-valve to protect against both excessive pressure and the unusual increase of temperature; and that both the pressure reducing and the safety (mercury) valves shall be provided with vent-pipes opening into the outer air. No acetylene gas or calcium carbide may be stored on the premises. Such a body of fire regulations does not offer a notable welcome to the acetylene light when worked by a high-pressure system of generation.

TECHNICAL RECORD.

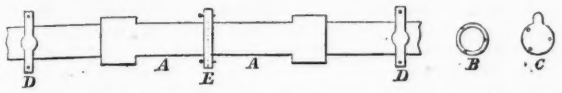
SOCIETE TECHNIQUE DU GAZ EN FRANCE.

The Papers Read at the Annual Congress.

(*Continued from p.* 110.)

AN ISOLATING APPARATUS FOR MAINS UNDER TEST.

This apparatus was described by M. Bürgkly. He said that the appliances hitherto devised for isolating sections of mains which were under examination for leaks were massive, clumsy, and as a rule expensive. All that was essential was a simple plan for isolating a certain length of main. The apparatus shown below answered the purpose. A A were two socket-pieces with flanges, of the same diameter as the main. B was a



cast-iron ring about ½ inch in thickness; and C was a disc of the same material and thickness as the ring. The holes in the main by which gas was passed to the meter, and to the section under test, were shown at D D. E was the flanged joint, from which the bolts were removed when it was desired to isolate a length of main. The ring B was then withdrawn from the joint, and replaced by the disc C. The bolts were then re-inserted. When the test was completed, they were again withdrawn, the disc was replaced by the ring, the bolts were put in, and the joint was coated with pitch for their better preservation. M. Bürgkly was of opinion that no simpler, more reliable, or less costly device than this would be found. When a new main was being laid, the cost of inserting such an isolating device was very low. It could be put in an existing service of about 6 inches diameter at an inclusive cost of about £1.

AUTOMATIC IGNITION.

An electrical igniting apparatus called the "Auto-Lux" was exhibited by M. Egraz, in connection with a variety of gas lamps and fittings. Some particulars of the apparatus had been presented to last year's congress by Dr. Guyenot; but it had since then been made practically serviceable. As shown by M. Egraz, it consisted of a copper casing in which the gas-passage was closed by a loose hard steel ball, which rested on the mouth of the passage. The ball was kept in position by the weight of a small block of soft iron. Above this block, there was fixed a steel bar surrounded by a bobbin, in the circuit of which was a platinum wire for igniting the gas. A burner of any suitable description surmounted the apparatus. When an electric current was passed through the bobbin, it converted the steel bar into a magnet, which lifted up the soft iron block; and the steel ball then allowed gas to pass up to the burner, where it was ignited by the platinum. The burner was extinguished by passing a slowly alternating current of diminishing intensity through the circuit. The steel bar was thus demagnetized; and the iron block then fell and pressed the ball over the mouth of the gas-passage, and at once stopped the flow of gas to the burner. The apparatus contained no clockwork, or mechanism of any kind.

M. Egraz stated that it was very suitable for lighting public lamps. The wires could be carried either overhead or underground. It was, of course, cheaper to place them overhead; and as they were very slight, and could be supported by extensions of the lamp standards, there were no great objections to this method of connection. In the case of town lighting, only 100 lamps would be connected to one wire. Thus any mishap to a conductor would not affect more than that number; and the affected lamps could be readily lighted by hand. The apparatus had been in use for nearly seven months at Aix-les-Bains, and had behaved perfectly, notwithstanding that the overhead wire had been subjected to storms, frost, and snow. The expense of the electric current was insignificant. It was calculated that only two-sevenths of the number of lamplighters and cleaners generally required was needed, when this system of lighting the street-lamps was adopted. There was, moreover, a saving of gas, because the whole of the lamps were lighted and extinguished at the precise time specified. For private lighting, a slight modification of the arrangement was recommended; and specimens of brackets, gaseliers, &c., fitted with the appliance were exhibited. M. Egraz believed that the "Auto-Lux" would be a valuable aid to the gas industry, because it furnished means of igniting and extinguishing burners with the same ease that electric lamps were controlled.

INCANDESCENT GAS LIGHTING AT ANGERS.

M. Bigeard gave some notes which supplemented his communication on this subject to last year's Congress at Clermont-Ferrand.* Later trials showed that the No. 2 Welsbach burner in the lantern described last year consumed 3·5 to 3·9 cubic feet of gas per hour, with an average service pressure of 18·10ths. In a working year of 3719 hours, 3 mantles and 1·15 glass-rod chimneys were used per burner. The chimneys preserved their translucency. The lighting of the burners and the cleaning of the lanterns were performed as speedily as with ordinary gas-lamps.

A METHOD OF USING WELSBACH BURNERS WITHOUT CHIMNEYS.

M. André Coze described a patented device that had enabled him to discard the glass chimney, and yet obtain a high duty with incandescent burners. He was led to make experiments because of the frequent fractures of glass-rod and even Jena chimneys in street-lanterns. He noticed that a mantle gave a fairly good light for six months when used without a chimney and under a high pressure of gas. The light was, however, unsteady in high winds. He then studied the course of the combustion in Welsbach burners, and tried the effect of placing above the chimney two small concentric cylinders, the inner of which was about the same diameter as the mantle, and was considerably longer than the outer cylinder. The light was decreased by the superposition of these cylinders; but when the supply of gas was diminished, the light regained its original intensity. A reduction of consumption had thus apparently raised the temperature of combustion. This effect appeared to find an explanation in the fact that the draught of the ordinary chimney not only exerted a pull on the mixture of gas and air in the bunsen, but also on the outer air, which passed up the exterior of the mantle, and cooled it. The cylinders, however, gave a stronger draught on the mixture within the mantle than on the external air, and thus diminished the cooling effect of the latter, and thereby the amount of gas necessary to raise the mantle to the temperature of incandescence. A Welsbach burner without a chimney was tested in the photometer, and gave its maximum intensity with a consumption of 3·07 cubic feet per hour. On placing two small concentric cones above the mantle, it was found that the same light-intensity was obtained with a gas consumption of only 2·47 cubic feet. The cones thus brought about an economy of 0·60 cubic foot per hour, and gave a high efficiency to the chimneyless burner. The results given by such an arrangement in practice were then compared with those from a Welsbach lamp with chimney. In the lantern used, two truncated concentrical cones were concealed between the reflector and the top of the lantern. The outer cone was 2·16 inches high, 2·75 inches wide at the base, and 1·77 inches wide at the top. The inner cone was 7·9 inches high, 1·57 inches wide at the base, and 0·79 inches wide at the top. This lantern was put at the fixed distance of 1 metre from the disc of the photometer; and opposed to it was one with an ordinary Welsbach burner with plain glass chimney. The distance of this burner from the photometer disc could be varied as required. A series of comparisons were then made—new and old mantles being used on both burners. It was found that the intensity of the light for a given consumption varied considerably with different mantles. The burner provided with the cones gave the best results at low pressures—viz., 7½·10ths to 10·10ths. It was assumed that the ordinary Welsbach burner, at the consumption which yielded the highest intensity, gave a duty of 1 carcel per 20 litres consumption (= 14 candles per cubic foot of gas). This was the duty found for it by M. Crova. On this assumption, the burner provided with cones would give an average duty of 1 carcel per 18·5 litres of gas (= 15·3 candles per cubic foot of gas). If the ordinary burner with chimney had been assumed to have a higher efficiency than 20 litres per carcel, then the duty obtained from the gas by the cone-device would also have appeared proportionately higher. The primary object of the trials was to find a means of avoiding the need for chimneys; and in attaining this object it was found incidentally that an economy of gas had also been achieved. The results had therefore an undeniable practical value.

(*To be continued.*)

* See "JOURNAL," Vol. LXVIII., p. 593.

GERMAN ASSOCIATION OF GAS AND WATER ENGINEERS.

Annual Meeting at Leipsic.

The Thirty-seventh Annual Meeting of this Association was held in the theatre of the Saxony-Thuringian Exhibition, at Leipsic, on the 16th, 17th, and 18th ult., under the presidency of Herr L. KÖRTING, Manager of the Hanover Gas-Works. The following account of the proceedings is abstracted from the official record of the Secretaries, which has been published in the "Journal für Gasbeleuchtung."

Business commenced at an early hour on the 16th with a cordial welcome to the Association, expressed on behalf of the town of Leipsic by the Chief Burgomaster, Herr Georgi. He said he was rejoiced to find that gas lighting exhibited a steady advance, notwithstanding the competition of electricity; and he was of opinion that the contest between the two means of lighting conduced ultimately to the public welfare. The objects of the Association were intimately identified with the executive duties of municipal authorities. The President thanked the Burgomaster for the cordiality of the welcome extended to the Association, in the name of which he desired to congratulate the town of Leipsic on its magnitude and importance, of which the local gas and water works, and the Industrial Exhibition then open, afforded apt illustration. The President then reviewed the objects of the Association, and directed special notice to the benefits derived from the annual meetings and

from the labours of their Commissions, of whose work in the past year he gave some details. The retrospect was tinged with sadness, on account of the loss sustained by the industry in the deaths of Herr N. H. Schilling and Herr Simon Schiele. The services still being rendered to the industry and the Association by Herr E. Grahn and Dr. Bunte deserved the warmest acknowledgment.

Herr G. Wunder, the Manager of the Leipsic Gas-Works, then read a paper on "The Development of the Lighting of Leipsic." He took his audience as far back as 1701, when the electoral government caused 700 lamps to be bought and maintained out of the gate dues, though the population of the town was then only 16,000. Blochmann erected the first gas-works in Leipsic in 1838. Herr Wunder described the growth and additions to the works, and the subsequent erection under his control of two more stations. The suburban districts are now partially supplied from three works owned by the Thuringian Gas Company. The author concluded with a description of the relative positions now assumed by gas, petroleum, and electricity in the lighting of the town.

Herr Reissner, of Berlin, then referred to the report of the Commission on Inclined Retorts, which was in the hands of members. The settings were described in the first portion; and the compilation of a record of the various experiences with them was deferred, in order that the fullest information might be collected. The work of the Commission was to be continued for another year. Herr Körting, of Vienna, supplemented the report by a paper on "Inclined Retorts and Charging and Drawing Machines." He gave the results of three years' experience at the Vienna works of the Imperial Continental Gas Association. The Coze settings at the Erdberg station had, he said, been very satisfactory indeed. A table giving comparative results with Coze settings and mechanical and manual stoking, was laid before the meeting. It did not pay to use mechanical stoking for fewer than twelve settings; and inclined retorts were only economical with a minimum daily production of about 160,000 cubic feet. In the discussion which followed the reading of this paper, Herr Grahn suggested that the Commission should study the Coze patents, in order to determine what constituted infringement.

Herr Thomas then spoke with reference to the work of the Photometric Commission, a copy of whose report was in the hands of the members. The Commission had recently held a conjoint sitting with a Commission of the Electrotechnical Association, for the purpose of discussing the names and signs of the measures of light. The Commission obtained re-appointment, in order to deal with the question of a standard gas-burner. Dr. H. Krüss, of Hamburg, then gave a paper on "The History of Photometry, Particularly in Regard to the Work of the Association." The Photometric Commission of the Association was first appointed in 1868, when it succeeded to the records of the work of a former photometric association. The Commission, in conjunction with the Electrotechnical Association and the Union of German Electrical Technicians, had adopted measures of light, of which the unit was "the candle," represented by the Hefner light. In order to avoid confusion, this unit was to be written as "Candle (Hefner)" or "HK." The German Associations were now unanimous in the adoption of this unit; and it was to be hoped that it would become international. The following definitions of the unit and its derivatives were given: (1) The unit of intensity is the candle. It is represented by the horizontal intensity of the light of the Hefner lamp. (2) The names and signs of the photometric magnitudes and units are given in the following table:—

MAGNITUDES.		UNITS.	
Name.	Sign.	Name.	Sign.
Intensity . . .	J	Candle (Hefner candle)	..
Effulgence (flux).	$\Phi = J\omega = \frac{J}{r^2} S$	Lumen	Lm
Illumination . .	$E = \frac{\Phi}{S} = \frac{J}{r^2}$	Lux (meter-candle) .	Lx
Brilliancy . . .	$e = \frac{J}{s}$	Candle per square cm.	..
Quantity . . .	$Q = \Phi T$	Lumen-Hour . . .	..

in which ω = a solid angle, S = a surface in square metres, s = a surface in square centimetres (both surfaces being taken at right angles to the direction of the rays), r = a distance in metres, and T = a space of time in hours.

Herr H. Drehschmidt, of Berlin, next spoke upon "Automatic and Distant Ignition." He said that attempts had for years been made to ignite distant burners by means of a small flash-flame and an increased or decreased pressure. Recently taps at a distance had been opened and shut by means of electricity; and ignition had been effected either by flash-flames or glowing platinum wire, or by sparks from a small induction coil. Quite recently the chemical method of ignition had been developed by the use of platinum sponge with a special flash-jet, which was extinguished by the heat of the flame proper as soon as the latter was ignited.* The development of automatic igniting apparatus was demonstrated by the exhibition of drawings, and a great number of incandescent burners fitted therewith.

The following day was chiefly devoted to topics of water supply. Herr Thiem read a paper on "The Artificial Production of Subterranean Water." He said that a good subterranean water should be perfectly clear, free from bacteria, and of uniformly low temperature. There were abundant natural means for the production of these essential qualities, which could not be secured by artificial filtration. In cases where the supply of subterranean water was insufficient, such water could be produced in the vicinity of streams from the surface water. One example was to be found in the alluvial deposits of the Isar on the Swabian-Bavarian plateau, where surface water at 62½° Fahr. and 6·6° hardness was changed in 1¼ miles to subterranean water at 46½° Fahr. and of 21° hardness. The water supply of the town of Essen, which was derived from the gravelly bed of the Ruhr, had enabled him to ascertain the laws which governed the production of a good subterranean water. The researches which had given him the values for the supply of upwards of 6,600,000 gallons of water daily to the town were described. The chief factors to be taken into account were the length of the filtering ground, the rate of flow of the subterranean water, and the depth from which the supply was to be taken. Herr Thiem also spoke of the formation of subterranean water from lakes. In the course of the discussion on the paper, Herr Nau, of Chemnitz, said at that town a satisfactory increase in the subterranean water had been secured by leading surface water through a great number of trenches. Herr Lindley was of opinion that it was impossible to obtain values by which the capacity of a natural filter-bed could be calculated, which would be accurate under all conditions; and he was dubious of the correctness of Herr Thiem's formulæ. Each case needed separate consideration; and artificial possessed the advantage over natural filtration, in that it was independent of the very partially known constitution of a natural filter-bed. Several other members took part in the discussion.

Herr Thiem then read his second paper, which was on "The Use of Woltmann's Sail-Wheel as a Water-Meter." This wheel had formerly been employed only to determine speed; but it was introduced at the Leipsic Water-Works for the purpose of measuring water, on account of its low resistance. It was inserted in a pipe 31½ inches in diameter, and sufficed for measuring 7 million gallons of water per day. It caused very little loss of pressure, was exact within 3 to 4 per cent., and had been in use for five years. Such meters were used on other mains at Leipsic; but they were useless for household supplies, as it was necessary for their application that the duration of flow should be known.

The report of the Commission on Water Statistics was placed in the hands of the members; and Herr Grohmann, of Düsseldorf, made a few remarks appertaining to it. Then Herr Zeisig exhibited and described the Meinecke water-meter, which is of the disc type, and is positive and not inferential, as are the meters commonly in use. In other words, it measures volume and not speed. It was stated to act well, and to be uninjured by frost.

Herr Grahn next read a paper on the "Water Supply of the Towns of Saxony." He showed that Saxony was very plentifully endowed with streams and rivers. It was, however, a very densely populated country; and the population was massed round tolerably large centres. Of the 138 towns in the kingdom, 96 had water-works. The water used per head was less; but its cost was higher than was usual elsewhere. The supplies were barely adequate for the existing requirements. Dresden was well supplied, and Leipsic and Chemnitz were tolerably well provided; but the smallest towns only secured a supply with difficulty and much expense. Some bronze pipes installed at Bautzen in 1603 were exhibited. They had sockets, and appeared to be good castings.

The report of the Commission on Heating by Gas was distributed among the members; and Herr Dellmann, of Duisburg, made some explanatory comments upon it. It was considered desirable that the Commission should continue their work. They had under consideration the compilation of a set of regulations for the installation of gas-services in houses; and they would seek out the reason of the high consumption of gas for heating and cooking in certain towns. Tables gave the increase in this consumption during the past six years in thirty large towns. Kaiserslautern showed the largest increase; Düsseldorf was second; Berlin, twenty-fourth; and Hamburg, twenty-ninth. The report on the Prize Competition for Coke-Stoves was presented without comment.

The proceedings on the third day of the meeting began with the reading of a paper on "The Incandescent Light and Acetylene," by Dr. H. Bunte. The incandescent light had been widely used, but the scientific investigation of it was very incomplete; while, on the other hand, it was pointed out that acetylene had been studied for a long time, but its recent adoption for practical purposes had been attended by many difficulties. Mantles consisted of 96 to 99 per cent. of thorium oxide, with the remaining small percentage of other oxides—generally cerium oxide. The Welsbach mantle contained 1 per

* See "JOURNAL," Vol. LXIX., p. 1186.

cent. of the latter. Mantles of pure thorium oxide gave a very feeble light; and those of pure cerium oxide gave only a weak red light. The mixture of the two oxides containing 1 per cent. of the latter, on the other hand, had a remarkable illuminating power, which, however, was diminished by an increase in the proportion of cerium oxide. Researches made with the electric furnace, showed that the light emission of carbon did not differ greatly from that of the rare earths, and that it was unaffected by their presence. The so-called emission theory of the Welsbach mantle was therefore inadequate; and it seemed that the powerful luminescence could best be explained by a contact or catalytic action of the mantle. The catalytic substances, of which cerium oxide was the most effective, accelerated the combustion, and thus caused a very high local temperature and intense incandescence. The thorium oxide served as a finely divided refractory basis, which kept apart the particles of cerium oxide, and prevented the fritting of the latter which ensued if it was heated unadmixed with a refractory substance. It had been computed that not more than 77 grains of carbon were separated in the flame when 5·3 cubic feet of gas were burnt in one hour; and it was to the incandescence of solid particles of carbon that the luminescence of the luminous flame was due. The solid substance was only 0·0015 grain on the volume of the flame; and it was not therefore surprising that about fifty times the amount of cerium oxide, when introduced into a flame, had a more intense action. The temperature of the mantle was raised by a quickening of the combustion—as by the use of gas under pressure, or by prolongation of the burner-tube. The Denayrouze burner effected such a quickening of the combustion. The zone of combustion could be confined to a greater degree within the mantle, if the latter were open at top; and the temperature of combustion could be further increased by giving the external air supply a certain velocity at right angles to the flame, by the employment of perforated chimneys. Passing on to acetylene, Dr. Bunte said that its application presented many difficulties. The slow after-development of the gas from carbide to which the supply of water had been interrupted, and the considerable liberation of heat in the reaction, were troubles which could be overcome by the use of attenuated water—such as 85 per cent. alcohol. Acetylene could be safely made in an ordinary Kipp's apparatus, with alcohol of that strength in place of unattenuated water; or the difficulties could be overcome by using coal gas or hydrogen saturated with steam, for the decomposition of the carbide. Acetylene could be more safely and economically stored as carbide than in the liquid state. Acetone readily dissolved acetylene; but it was a comparatively dear substance—costing about 40s. to 50s. per cwt.—and was volatile, so that there was no probability that it would be largely used in the future as a means of storing acetylene. The rate of propagation of the combustion of explosive mixtures of acetylene and air was greater than that of coal gas and air mixtures; and the explosive limits of the former mixtures were wider. Dr. Bunte concluded by exhibiting a number of acetylene burners made for him by a Nuremberg firm.

Dr. Polis, of Aix-la-Chapelle, then exhibited the recent pattern of the Denayrouze burner, in which the fan is abolished, and its duty is performed by an extended burner-tube. The new burner is quite independent of the gas pressure. Dr. Polis said that a great difficulty in the use of acetylene was that the burner very readily became choked with soot. Herr W. von Oechelhaeuser thought that the Denayrouze burner would be specially useful for street lighting.

The report of the Commission on Gas-Meters was presented by Herr Reichard. The spread of prepayment meters abroad was referred to by him; and Herr von Oechelhaeuser gave some notes on their use at Dessau. Herr Kemper, of Dessau, then read a paper on "Incandescent Lighting for Streets." Only extracts from a number of replies to inquiries made by him were given in the paper; and it was stated that the full report would be published later.

The Council were empowered to confer with the Association of Gasholder Makers, on the terms of contracts for gasholders. On the motion of Herr Lindley, a Committee were appointed to confer with a similar body appointed by the Association of German Electrotechnicians on the best means of preventing injury to gas and water pipes from the return currents of electric tramways. Herr von Oechelhaeuser presented the report of the Commission on the Instruction and Training of Gas Engineers.

Herr Müller, of Charlottenburg, was the retiring member of the Council; and Herr Lindley, of Frankfort-on-Maine, was elected to take his place. Three new members of the Committee were also elected, to fill vacancies caused by retirements. Nuremberg was selected as the venue of the next annual meeting. Over 600 members and guests participated in this year's proceedings at Leipsic.

The major part of the report of the Council has already been given in abstract form in the "JOURNAL" for the 29th ult. (p. 1499). We omitted then to refer to the affiliated Associations, of which there are now seven. The Marks Association of Gas and Water Engineers has now 153 members. They held their seventeenth annual meeting last year at Cöpenick, under the presidency of Herr. H. Schneider, of Cottbus. The Mid-Rhenish Gas and Water Engineers' Association held their thirty-third annual meeting at Mannheim in August last. The President is Herr Merz, of Cassel; and the membership numbers 118. The Association of Gas and Water Engineers of Silesia and Lausitz has 112 members; and the twenty-eighth annual meeting was held at Hirschberg in September last, under the presidency of Herr A. Thomas, of Zittau. The Association of Gas, Electrical, and Water Engineers of the Rhine Provinces and Westphalia held three meetings during the past year. Herr Söhren, of Bonn, is the President. The Bavarian Association of Gas and Water Engineers has 103 members; and the twelfth annual meeting was held at Bayreuth in April. The President is Herr E. Ruoff, of Ratisbon. The Baltic Association of Gas and Water Engineers held their twenty-fourth annual meeting in June, 1896, at Berlin. The President is Herr Metzger, of Bromberg. The Association of Gas and Water Engineers of Saxony-Thuringia held their forty-third meeting in March, at Altenburg. This Association has been in existence for 25 years, and has 131 members. The President is Herr Achtermann, of Annaberg.

SOCIETY OF CHEMICAL INDUSTRY.

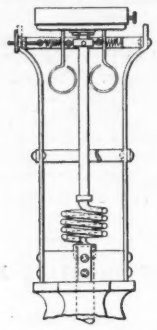
The Annual Meeting of this Society was held at Owens College, Manchester, last Wednesday, under the presidency of Dr. Edward Schunck, F.R.S. About 150 members, representing the industry in all parts of the country, were present. The report of the Council was read by the Secretary (Mr. C. G. Cresswell). It stated that the number of members on the register was 3037, as compared with 2971 last year; and that there had been 226 additions to the roll. During the past year, 104 papers appeared in the Society's "Journal," as compared with 92 in the previous year. The excess of revenue over expenditure amounted last year to £1011, against £162 before. This large difference was accounted for by the fact that various important economies have been effected. The report was adopted. The President then delivered his Inaugural Address, which was chiefly of a reminiscent character. He described John Dalton when, as a youth, he knew him; and referred to the Henry family—three generations of whom were connected with the chemical industry in Manchester in Dalton's time and subsequently—and other chemists, as well as to the founders of the great calico-printing trade of the district. Impurities in air and water received attention; the President remarking that some sceptic might ask whether there is any evidence such as would satisfy a scientific inquirer that the waters of polluted streams really have so deleterious an effect upon the health of the riparian dwellers as is sometimes asserted. Free trade and foreign competition were questions dealt with by the President; his views thereon being rather optimistic than otherwise. At the close of the address, a hearty vote of thanks was accorded to him. Professor Frank Clowes, of Nottingham, is the new President; and the next meeting of the Society will be held in that town. In the afternoon, Dr. Schunck gave a garden party; and during the day visits were paid, among other places, to the gas and electric light works. In the evening, the members were received in the Town Hall by the Lord Mayor (Alderman J. Foulkes Roberts) and the Lady Mayoress (Miss Roberts). The rest of the week was occupied with visits and excursions.

North British Association of Gas Managers.—We have received from Mr. R. S. Carlow, the Secretary, the programme of the 36th annual meeting, which will take place at Ayr, on the 29th and 30th inst., under the presidency of Mr. A. Bell, of Dalkeith. The business will be transacted in the Council Chambers; and, as usual, it will open with the presentation of the reports of the Committee and the Auditor, the admission of new members, and the election of office-bearers. The President will then deliver his Inaugural Address; and this will be followed by the reading and discussion of papers, of which there will be only three. The first on the list is one on "Ways and Means of Increasing the Consumption of Gas," by Mr. Hubert Pooley, of Dunfermline; the next is on "Prepayment Meters," by Mr. T. Wilson, of Coatbridge; and the last is on "The Best and Most Economical Means of Gas Purification," by Mr. D. M. Nelson, of Glasgow. The report of the Sub-Committee of the Murdoch Memorial Fund will be submitted to the meeting. At the conclusion of the business, the members and friends will dine together in the Glasgow and South-Western Station Hotel. In the evening, by invitation of the Ayr and Newton-Ayr Gas Companies, the party will be conveyed in brakes to Burns's cottage and monument, and to various places of interest in the vicinity associated with the name of the immortal poet. On the following day, an excursion will be made by steamer to Ormidale, *via* Ardrossan, the Kyles of Bute, and Loch Ridden; with the option of returning to Glasgow *via* Greenock for those who desire to do so. As the meeting will be held in the Land of Burns, the programme is embellished with views of the poet's birthplace and farm, his monument, and the old Brig o' Doon—the scene of the accident to Tam o' Shanter's grey mare Meg when that worthy was being pursued by the witches on his homeward ride; and an illustrated guide is also issued with it. Altogether, the meeting should be an interesting and enjoyable one.

REGISTER OF PATENTS.

Fittings for Incandescent Gas-Lamps.—Cripps, F. S., of Great George Street, S.W. No. 13,204; June 16, 1896.

This "invention" consists in the application of a pipe coiled into the form of a spring, for supporting incandescent gas-light burners, lanterns,



or globes, in such a way as to diminish the damaging effect of horizontal and vertical vibrations on the mantle. The patentee also claims the employment of horizontal adjustable springs, for preserving the central position of the lantern or burner.

Lanterns for Incandescent Gas-Burners.—Marriage, T. S., of Reigate. No. 15,799; July 17, 1896.

One of the main objects to be attained by this invention is to avoid the supporting of street, and such like lamps and lanterns, by means of rigid supports, whereby the vibration caused by street traffic and similar

disturbances cause destruction of mantles and other injuries. The patentee avoids the use of rigid supports or points of contact between the lantern and its retaining means, and uses instead spring supports and retainers, supplemented in some cases by elastic buffers.

Producing Light for a Certain Length of Time.—Lasnier-Hubert, P., of Rieux, France. No. 17,208; Aug. 4, 1896.

When applied to apparatus suitable for gas illumination, the arrangement consists of a pivoted lever having one end connected to a pull, while the other end is fixed to an axis carrying first a spring ratchet connected to the clockwork mechanism with a flyer, and secondly attached to one end of a spiral spring, so that by the downward motion of the lever, and consequent partial rotation of its axis, the spring is wound up to a certain extent, but its action is at the same time controlled by the connection with the clockwork and flyer through the ratchet gear. Thus on releasing the pull on the lever, this will only be moved up slowly again by the spring controlled by the clockwork and flyer. The lever carries a projecting stud, which on its downward motion pulls down a rod, to the upper end of which is connected a valve, pressed by a spring against a seat on the gas-supply passage. Therefore, by the downward motion, the valve is pulled open in order to allow the gas to flow to the burner; the rod being held by a catch at the end of the downward motion, so as to keep the valve open. The gas having been lit, it continues to burn until the lever, at the end of its slow upward motion, acts upon the catch and releases the valve-stem; the valve being consequently closed, and the light extinguished.

Generating and Liquefying Acetylene.—Fraser, A. C., of New York. No. 17,678; Aug. 10, 1896. Date claimed under International Convention, Feb. 21, 1896.

This patentee claims to have "conceived" a process for liquefying acetylene in which the use of high pressure combined with high temperature is avoided; the invention being based upon the theory that the pressure and heat involved in the ordinary processes are largely, if not entirely, responsible for the explosions that frequently occur. Means are provided herein for preventing the accumulation of an excessive pressure by the newly generated gas, for preventing the generation thereof at a high temperature, and (after cooling the gas) for mechanically increasing its pressure to such extent as to liquefy it.

To enable the advantages of his invention to be understood, he gives an example of practical conditions for carrying it into effect. Employing a medium capable of cooling the stream of gas to approximately 32° Fahr., the gas may be compressed by its own generation to 120 lbs. above atmospheric pressure (9 atmospheres). Under this pressure, its initial temperature cannot rise above the corresponding vaporizing point of water—that is 350° Fahr. The generation of the gas is so controlled that it is evolved no faster than just sufficient to maintain this pressure; and it is immediately cooled by condensing water or other cooling medium, whereby all steam which passes off with the gas is condensed and drained off. The gas is preferably then further cooled, and afterwards passes to a compressing-pump, whereby its pressure is raised, for example, to 308 lbs. (21½ atmospheres); and it is then again cooled to approximately 32° Fahr. to liquefy it.

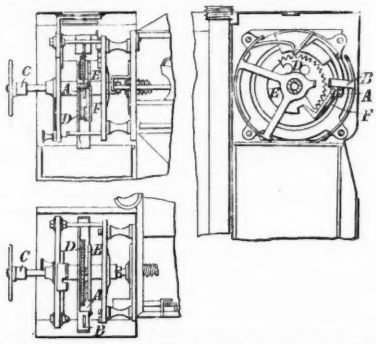
Or, as another example, the gas may be generated under a pressure of 165 lbs., so that its temperature cannot rise above 373° Fahr. Immediately it is cooled by condensing water to (say) 56° Fahr., and is then further cooled by the circulation of a refrigerant liquid from an ice-machine; being thereby reduced approximately to zero. This causes any remaining aqueous vapour to be deposited as snow upon the cooling surfaces. The cold and dry gas then passes to a compressing-pump, whereby its pressure is raised by 30 lbs., thereby compressing it to 195 lbs. pressure, and at the same time somewhat raising its temperature. The gas is then passed through a condenser cooled to (say) zero, whereupon at this increased pressure the gas liquefies. Any other gases—as oxygen, hydrogen, &c.—which may have been mingled with the acetylene as impurities, are separated from it by its liquefaction; and in the receiving-vessel these gases accumulate at the top over the liquid acetylene, and may be blown off from time to time. The low temperature at which the acetylene is maintained liquid prevents any wasteful blowing off of acetylene at the same time.

By a modification involving part of the invention, mechanical compression may be wholly dispensed with, though to less advantage. For example, by employing a refrigerant at the temperature above instanced, the original pressure of generation must be raised to 195 lbs., which involves an initial temperature of 386° Fahr., instead of 373°.

The lengthy (8-page) specification, with 16 separate claims, is not understandable apart from the four sheets of drawings by which it is accompanied.

Prepayment Gas-Meters.—Cowan, W. & W. H., of Edinburgh. No. 18,098; Aug. 15, 1896.

This invention has for its object to improve the coin operating-mechanism described in patent No. 13,200 of 1895; and it consists of means for re-setting the coin prepayment-wheel when, from any cause, it gets out of its proper relation to the coin carrier or pocket.



The patentees employ a pawl A pivoted to the back of, and moving with, the pusher B, which is operated by the handle C. The pawl is formed double—one portion being arranged to act upon the teeth of the prepayment-wheel D, while the other portion works upon the disc E, which is provided with a notch or recess. Secured to the back of the pusher, and above the pawl, is a spring F, for the purpose of keeping the pawl in contact with the notched disc and prepayment-wheel respectively, at the required periods. The pawl only gears into the coin-wheel during a very small part of the pusher's travel—being kept out of gear during the remainder of the travel by means of the circular disc E, which does not revolve, but only acts as a support to the second portion of the pawl referred to above; thus keeping the first portion out of the teeth of the wheel in every position except one, and that is where the notch in the edge of the disc allows the pawl to drop into gear when the pawl, carried by the pusher, approaches the end of its backward journey. Hence, if the wheel be in due relation to the coin-pocket, the pawl will, on the portion reaching the notch, simply fall into the recess between two of the teeth, and will do nothing. But, if the wheel be ever so little out of its proper relation to the coin-pocket, the pawl will, by pressing against the tooth, restore the wheel to its normal position.

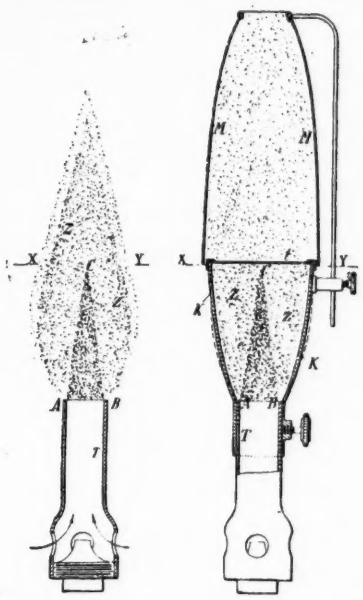
Incandescent Gas-Burner.—Denayrouze, L., of Neuilly, France. No. 21,371; Sept. 26, 1896.

This invention relates to the combination with a bunsen burner for incandescence of "a fixed or adjustable shell enclosing and approximately fitting the ovoid form assumed by the gas and air issuing from the burner tube, and terminating with a pervious diaphragm on a level with what would be the apex of the blue cone, observed where there is a flame without an enclosing shell."

The patentee points out in his specification that he has observed that the flame of a bunsen burner, as shown in fig. 1, as it issues from the tube T, has certain characteristics which are found in bunsen flames of any size supplied with gas at any pressure. In the centre there is a blue cone A B C, having its base A B about the same in diameter as the mouth of the tube T, and a height which varies with the length of the tube—being about equal to the square root of the length, as found by experiment. Around the internal cone, there is a shell Z of brighter flame, bounded, so to speak, by an almost translucent surface of revolution of ovoid form; and the longer it is, the longer is the blue cone. The appearance of this flame clearly indicates that in all that part of the flame which is below the horizontal plane X Y, which passes through the apex C of the cone, the mixture of gas and air is incomplete; the centre having too much gas, and the air not having penetrated completely among the molecules of gas until above the plane X Y. Furthermore, if above this flame the streams have the best admixture of gas and the best velocity, it is obvious that, as they ascend, the presence of the surrounding cold air alters gradually from the circumference to the centre the composition of the mixture, and lessens the ascending force.

In consequence of these observations, the patentee has devised, as shown in fig. 2, the enclosure of the ovoid space Z by a cup K of substantially the same form as the flame would be, and having its upper edge at the level of C the apex of what would be the blue cone. Above this cup is supported an incandescence mantle M. Thus only gas and air thoroughly mixed penetrate the meshes of the mantle. It is better that the shell K, though generally following the outline of the ovoid Z, should be somewhat smaller in diameter towards its base at the mouth A B, whence it gradually widens out, until it becomes nearly cylindrical as it approaches the plane X Y. A diaphragm of wire gauze or finely perforated sheet metal prevents the flame striking back into the shell.

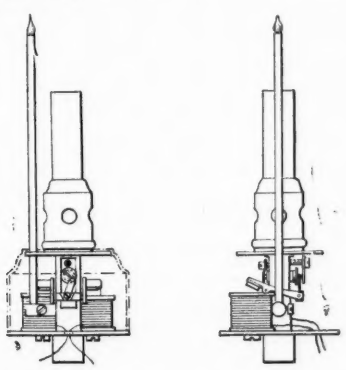
FIG. 1 FIG 2



Experiments with a burner of this kind are said to show a marked increase of illuminating power; but obviously the construction may be applied to mouths of various sizes—the parts being suitably proportioned. The shell K might be made in one piece with the tube T; but it is of advantage to make it adjustable in height. As the apparatus has, as it were, a chimney draught, the admission of air and the speed can be varied by raising or lowering the shell; the apex of what would be the blue cone being still at the level of the base of the mantle.

Lighting and Extinguishing Gas-Jets.—Krieger, G. F., of Kiel, Germany. No. 22,326; Oct. 8, 1896.

This invention relates to an electric lighter for gas-burners, more especially of the incandescent type; and it belongs to the class of device which enables the igniting and extinguishing of the burners to be effected from a dist nce.



To the gas-pipe carrying the ordinary burner-tube of an incandescent lamp (as shown in the engraving) is attached an electro-magnet having its coils connected with circuit wires leading from a central station to the lamp. Above the magnet is arranged a spring-actuated armature lever, pivoted to the gas-pipe, and having on its free end a movably fixed upright arm, which engages a slotted disc on the projecting extremity of the rotary gas-cock mounted in the gas-pipe. The diametrical slot of the disc attached to the gas-cock, has on either of its ends an enlargement or recess, the purpose of which will be described farther on. Stop-devices limit the rotary motion of the cock, according to its opened or closed positions. A small auxiliary burner-tube, which receives gas from the gas-pipe at a place below the cock, is kept constantly burning, to ignite the main burner as soon as the cock has been opened.

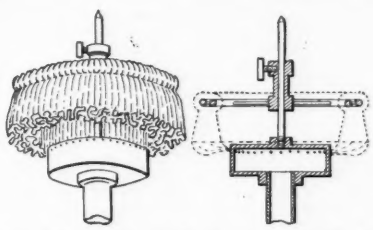
When the electric circuit is closed at the distant station, the armature lever will be attracted by the energized electro-magnet. By this movement of the armature lever, its arm engaging one of the recesses of the slotted disc is moved upward, and thereby rotates the gas-cock to a certain extent—limited by one of the above-mentioned stop-devices, in order to open the cock for supplying gas to the burner, which will be ignited by the pilot-flame of the auxiliary burner. When the circuit is broken, the armature lever is moved back by its spring.

To prevent back-motion of the gas-cock when its operating arm is retracted by the returning armature lever, the operating arm is adapted to slide along in the slot of the disc, and to move from one of its recesses into the other. In this position, the operating arm is adapted to rotate the cock in the opposite direction, and to cut off the gas supply to the burner as soon as, by the closure of the circuit, the armature lever is again attracted by the electro-magnet.

After the circuit has been re-opened, the operating arm of the cock slides again along in the slot of the disc fixed to the cock, and moves into the recess at the other end of the slot. In this position the operating arm is adapted to open the cock in the manner already described.

Incandescent Gas-Lamps.—Léry, J. B. de, of New York. No. 9940; April 21, 1897.

The primary object of this invention, says the patentee, is "to provide a burner and lamp which shall meet the requirements of a street light, in that the incandescing element shall be of such construction as to resist the shocks from storms and the jarring from heavy traffic. A further object is to provide a burner which will shed its rays of light downward and laterally, without interference from any portions of the burner or fixture itself."



The most generally used incandescing material, the inventor points out, is a web of textile material, usually in the form of a tube or hood; but it has also been made in the form of pencils individually supported and grouped together, and in the form of blocks. One of the main difficulties experienced with an incandescent element in the form of a hood is that it is very fragile. By the present invention, it is said to be possible to obtain all the advantages of an incandescing element constructed of webbing, and yet impart strength to it by folding the web upon itself a number of times or by using "a number of layers of it secured together, in such a manner that the several layers mutually support one another, thereby obtaining in the single structure the combined strength of the entire number of layers of material." The burner (as shown) is formed by making the tufts in this manner, and mounting them side by side in a ring. An exposed edge of this ring of tufts is then subjected to a series of small flames from a bunsen burner, which raises the edge of the tufts to incandescence, and forms a continuous ring of light. The burner from which the flame-jets emanate is a cylindrical drum of less diameter than the ring of incandescent material, and located only slightly below the ring, so that the rays of light from it may project uninterruptedly downwards and outwards.

Composition for Making Gas.—Stephenson, A. A., of Sydney, New South Wales. No. 10,371; April 26, 1897.

The patentee proposes, as a method of producing gas, the application of ordinary atmospheric air to a composition consisting of ½ lb. of camphorated chalk, ½ lb. of ground resin, and two tablespoonsful of table salt. After mixing these together, and grinding them to a fine powder, there is added ¼ pint of shale oil, and the whole is kneeded until it is of the consistency of a pasty mass. The mixture is then passed into any suitable apparatus or receptacle; and after being distributed over the extended surfaces, the following liquids are poured in: ½ gallon of gasoline, ½ pint of ether, ¼ pint of petroleum, and two tablespoonsful of bisulphide of carbon.

APPLICATIONS FOR LETTERS PATENT.

15,963.—Kiesewalter, A., "Improvements in incandescence mantles." July 5.

15,966.—Salomon, A., and Jacquin, J., "Generation of acetylene gas." July 5.

15,980.—Sello, E., Schaefer, O. F., and Lehmbeck, T., "Oil and gas engines." July 5.

16,009.—Daniel, G. A., and Williams, J., jun., "Gas reversing and other valves, applicable to gas regenerative furnaces." July 6.

16,070.—Empain, E., and Glibert, T., "Meter for liquids, gases, and other fluids." July 6.

16,110.—Hawkyard, J., and Braddock, J., "Gas-meters." July 7.

16,132.—Falk, Stadelmann, and Co., Ltd., "Acetylene gas burners." A communication from K. Thurnauer. July 7.

16,153.—Bawtree, A. E., "Improved bye-pass burner." July 7.

16,193.—Dougill, J., jun., "Gas and oil motor engines." July 8.

16,219.—Durrant, W., "Pipe-joints." July 8.

16,259.—Fouquier, Viscount E. P. de, "Automatic distributor of gas and electricity." July 9.

16,267.—The Company S. Elster and Sommerfeld, C., "Prepayment Meters." July 9.

16,284.—Challiss, P. G., "Apparatus for measuring and delivering fluids." July 9.

16,344.—Aykroyd, J. & B., "Apparatus for making acetylene gas." July 10.

16,370.—Conihe, O. F., "Gas or vapour cocks." July 10.

16,398.—Haddan, R., "Production of carbide of calcium." A communication from H. Colberg, A. Serret, and F. Amigo. July 10.

16,399.—Bracklow, C., "Gas motors." July 10.

16,403.—Johnson, J. Y., "Casings for gas-meters." A communication from W. H. Hopper. July 10.

CORRESPONDENCE.

[*We are not responsible for the opinions expressed by correspondents.*]

The Incandescent Gas-Light as an Outdoor Illuminant.

SIR,—My attention has been called to reports in the Press of a recent meeting of the London County Council to consider a recommendation of the Highways Committee that the Victoria Embankment should be illuminated by electric light. In the report I find the following: "Earl Russell, Chairman of the Committee, speaking somewhat as an authority on electric lighting, stated that the reports that had been gathered by the Council's officers showed that incandescent gas lighting out of doors had been unsuccessful."

It is impossible for us to allow a statement coming from such a quarter to pass uncontradicted, the more so as there is no justification for the condemnation passed on the incandescent gas-light as an outdoor illuminant. I will not trespass at any unnecessary length upon your space, nor will I advance any arguments on the question at issue; but I will do what is far more convincing—viz., give the experience of responsible and well-known authorities who have had practical experience of outdoor lighting by the Welsbach incandescent gas system, and whose opinions, therefore, are likely to carry more weight than those of authorities on electric lighting or of officers of the London County Council.

The following is an extract from a letter received as lately as the 10th inst. from Mr. C. R. Bellamy, the Superintendent of the Gas and Lighting Department of the Liverpool Corporation:—

I am at present engaged on the preparation of a report upon the subject of street lighting, following an inspection of all the best systems, English and Continental, and am specially dealing with the application of this lamp in Liverpool to the order of the Lighting Committee. Without going into details, I may say we find that the renewal of mantles per burner per annum is only 2·6, and that the average life of the mantle works out at 1137·3 lamp-hours. We have mantles that have been in use for eight months, and plenty over six months, yielding still 10 candles per foot of gas.

It may be interesting to know that 2000 incandescent gas-light burners are now in use in Liverpool for street lighting.

Mr. F. G. Dexter, the Manager of the Winchester Gas Company, and one of the leading authorities on the subject in this country, in a paper read by him before the Incorporated Gas Institute in June, 1896, on the incandescent gas-light system as a street illuminant, related in detail the result of his three years' experiments with the system—experiments which resulted in the system being applied to all the street-lamps in Winchester. In every respect he pronounces the system to be satisfactory; and he ends his remarks with the following statement:—

The Welsbach light is undoubtedly one of the greatest aids to successful competition that the gas industry has ever experienced. Its influence, while reducing the relative cost of light, has advanced the consumption of gas all over the country by the increased satisfaction of the existing consumers and the attraction of others. The writer feels that its influence should not be confined to the house. It is capable of meeting every competitor *in the street*, from cheap oils to arc lights, in cost and in effect.

Mr. E. C. Sayer, the Gas Inspector for the Borough of Ipswich, in a report made by him to the Electric Lighting Committee as to the cost of adopting the incandescent system of gas lighting for street-lamps, showed that an incandescent gas-burner has an illuminating power, expressed in candles, more than three times as great as the best ordinary burners or the incandescent electric lamp, and that its adoption in Ipswich, while enormously increasing the existing illuminating power, would at the same time effect a very considerable saving.

Hundreds of reports equally favourable to the above might be submitted; but the best proof of the satisfaction given by the incandescent gas-light system for street lighting is afforded by the fact that it has been adopted, and its use is continually being increased, in the most important towns throughout the kingdom; while seacoast towns, where the lights are exposed to severe conditions of weather, appear to favour it especially. In such towns as Dover, Ramsgate, Southend, Folkestone, Eastbourne, Margate, Yarmouth, Douglas, Lowestoft, Worthing, Ryde, Bournemouth, Penzance, &c., thousands of these lights are in use, and are giving every satisfaction, as is evidenced by the continual increase going on in the number of installations.

In London and the suburbs, more than 5000 of these lights are in use; and, considering the very conservative nature of the London municipal and other authorities, this conclusively proves the suitability of the system for street lighting.

In conclusion, I would only point out that about two years ago we submitted to the London County Council a detailed estimate for lighting the Embankment; showing the saving that would be effected in the present gas consumption and the increase of light which would result. From that day to this, however, we have had no communication from the Council on the subject.

L. DE FONBLANQUE,
Secretary, Incandescent Gas-Light Company, Limited.

14, *Palmer Street, Westminster, S.W., July* 16, 1897.

The Middlesbrough Gasholder Accident.

SIR,—The further information on the above accident which is furnished by the valuable report of Mr. H. Woodall is sufficient evidence to attribute the cause of the whole mischief to the uneven settlement of the tank throwing the holder out of level, and thereby unsealing the cups. Few engineers would care to place any confidence in such a foundation as this great structure is built upon; and it appears almost imperative that the programme for reinstating the holder should include some precautionary measures for strengthening the tank foundations. Otherwise there seems great possibility of such disastrous results as were recently experienced being repeated. The unequal settlement of the ground which is reported to be still going on is alarming; as, with this heavy structure resting upon such a treacherous substratum, it is impossible to say where disaster will end unless some measures are adopted to reduce the evil effects of this abnormal subsidence. It is, of course, impossible to avoid settlement; and the fact of the structure settling is, as stated by the Gas Committee some time ago, of no great import. This is true providing that the settlement is uniform and of no great depth, and that the relative positions of the tank and gasholder are unaltered, in order to maintain a sufficiently perfect horizontal plane for the hydraulic cups of the holder.

From the published information available, it would appear that the nature and bearing strength of the 5-feet bed of clay (resting as it does upon such a treacherous substratum as running sand) has been overburdened by a somewhat excessive load of 30 cwt. per square foot. A pressure of 20 cwt. per square foot of bearing surface is surely sufficient load to place upon such a foundation. Is it not unfortunate also that the tank should have been built upon the *surface* of the ground, as the variations in temperature at the different seasons will cause the clay soil upon which the concrete bed is laid to expand and contract considerably? Wherever steel gasholder tanks are erected on such expansible soils as that at Middlesbrough, the concrete bed should be taken sufficiently deep to be below the line of saturation, and beyond the effects of the atmosphere. Would it not be advisable to arrest the lateral escape of the running sand, which could doubtless be accomplished by sheet piling round the edge of the concrete bed? The line of saturation could be raised, and the clay protected from atmospheric influence, by the formation of an embankment round the tank.

The defects enumerated are elements of danger, and it would appear that much good might be done by giving the concrete bed some further assistance, and thereby increase the strength and stability of the foundations.

R. J. MILBOURNE.

July 14, 1897.

Cardiff Corporation Water Supply.—On the recommendation of the Water Engineer (Mr. C. H. Priestley), the Cardiff Corporation Water Committee have determined to spend £3000 in laying a new trunk line from Cogan reservoir to the top of Windsor reservoir. The alteration will have the effect of greatly improving the supply.

Burton-upon-Trent Gas Supply.—At the meeting of the Burton-upon-Trent Town Council last Wednesday, the Gas and Electric Light Committee reported that they had passed a resolution to reduce the price of gas, except that supplied to prepayment consumers, at the rate of 2d. per 1000 cubic feet; and the consent of the Council to the alteration will be sought at the next meeting. The Engineer and Manager (Mr. F. L. Ramsden) reported that in the five weeks ending July 2 the consumption of gas had been 16,733,000 cubic feet—an increase to the extent of 1,207,000 cubic feet compared with the corresponding period last year.

Wellington (Somerset) Gas Company.—The Engineer and Manager of the above-named Company (Mr. P. Thomas) has lately made up his accounts for the year ending the 24th of June. The sale of gas in that period produced £2283; meter-rents, £83; public lighting, £470; and residuals, &c., £511—the total revenue, with a small balance brought forward, being £3389. The expenditure was £2314 (coals costing £1272); leaving a balance of £1075. The Company's paid-up capital is £9000; and the land, works, and plant figure in the balance-sheet for £10,401. The capital works out to £620 per million cubic feet of gas made, and 13s. 1d. per 1000 cubic feet sold. The coal carbonized was 1391 tons 11 cwt., and it cost on an average 18s. 7½d. per ton. The make of gas was 14,510,000 cubic feet, of which 13,768,000 cubic feet were sold. Per ton of coal carbonized, the make was 10,427 cubic feet; and the sale, 9894 cubic feet. The unaccounted-for gas, including that used on the works, was 3·9 per cent. of the make.

The Bacteriological Examination of London Water.—In their report to the Official Water Examiner for the Metropolis (Major-General A. De Courcy Scott, R.E.) on the average composition and quality of daily samples of water taken by them during the past month, Sir W. Crookes and Professor Dewar state that, of the 168 samples examined, all were found to be clear, bright, and well filtered. Referring to the remarks in their previous monthly report as to the impossibility of comparing microbial estimations on the same water by different experimenters, unless the samples were taken at the same time and place, and the subsequent processes of treating the samples for plate cultivation of bacteria were absolutely identical, they say they are strikingly borne out by a report recently addressed to the London County Council by their Chemist (Mr. W. J. Dibdin, F.I C., F.C.S.), where stress is laid on a great discrepancy between the numbers given by Sir Edward Frankland and themselves. They point out that a discussion of differences of this kind would only be possible when all the analysts adopt the same method of bacteriological cultivation. Samples of raw river water show continual variations according to the season, atmospheric conditions, and rainfall. As before mentioned, Sir W. Crookes and Professor Dewar take several samples daily, and give the averages. Other chemists, taking samples once a week or once a month, could not, they say, unless by mere chance, hit upon the averages they record.

Proposal to Light Merchantsville (N.J.) by Acetylene.—These particulars are taken from the current number of "Progressive Age": The burning of the small gas plant at Merchantsville, N.J., last month, and the non-supply of gas to the town occasioned by that disaster, afforded the acetylene people an opportunity to slip into Merchantsville, and confer with the councilmen for the privilege of supplying the borough with acetylene. At a meeting of councilmen held on the 10th ult., it was reported that there were three sealed bids received for the contract, and the Acetylene Company's bid, being the lowest, was adopted after a slight discussion. The agreement is substantially that the Company will furnish the borough with lights at a cost of $19 per lamp per year, while the rate to private consumers will be $1·25 per 100 cubic feet, based on the rate of gas, with a clause to reduce the price 10 or 15 per cent. when the number of private consumers shall reach 175. As to a guarantee, the representative of the Company stated that the $20,000 plant the Company would erect would prove sufficient; but in case the borough demanded further guarantee, bonds would be drawn up. He further stated that they would give an indemnifying bond to offer the borough the first chance to purchase the plant if they ever wished to do so. The motion to accept the acetylene bid was agreed to by a unanimous vote. Our contemporary remarks that, if the plan is carried out as contemplated, "Merchantsville will have whatever distinction may attach to its having been the first town to introduce acetylene on a commercial scale."

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bills read the first time and referred to the Examiners: Leicester Corporation Bill, Manchester Corporation Bill, Salford Corporation Bill.

Bills read a second time: Borrowstounness Water Provisional Order Bill, Duntocher and Dalmuir Water Provisional Order Bill, Kingston-upon-Hull Corporation Bill.

Opposition withdrawn: East London Water Bill, New River Company Bill, Weymouth Water Bill.

Bills reported: Dundee Corporation Bill, East London Water Bill, Pwllheli Corporation Bill, St. Neots Water Bill, Swadlincote District Gas Bill, Weymouth Water Bill.

Bills read the third time and passed: Cirencester Water Bill, Colne Corporation Bill, Llandudno Urban District Council Bill, Newark Corporation Water Bill, St. Neots Water Bill, Swadlincote District Gas Bill.

Bills Royal Assented: Arundel Gas Bill, Carnarvon Corporation Bill, Crowborough District Water Bill, Dublin Corporation Bill, Eastbourne Water Bill, Hunstanton Water and Gas Bill, Local Government Provisional Order (Gas) Bill, Lowestoft Water and Gas Bill, Luton Water Bill, New Hunstanton Water and Gas Bill.

The Duntocher and Dalmuir Water Provisional Order Bill and the Borrowstounness Water Provisional Order Bill have been referred to a Select Commitee, consisting of Lord Heneage (Chairman), the Earl of Suffolk and Berkshire, the Earl of Eldon, the Earl of Dartrey, and Lord Braye; to meet on Tuesday, July 20.

HOUSE OF COMMONS.

Wednesday, July 14.

METROPOLITAN WATER COMPANIES BILL.

The House went into Committee on this Bill, the principal portions of which were given in the "JOURNAL" for the 1st ult. (p. 1257). On clause 1, which provides that water consumers may lodge complaints with the Railway and Canal Commission,

Lord H. CECIL moved an amendment in the following terms: "If the Commissioners, after hearing any complaint under the preceding sub-section, are satisfied that the Company have acted negligently, and, by so acting, have endangered the health of any person or persons, the Commissioners may impose a penalty of not exceeding ten pounds on the Company in the case of every person whose health has been so endangered. Such penalty shall be enforced in the same manner as any penalty imposed under section 16 of the Metropolis Water Act, 1871." He said he was confident the object of the amendment would command the sympathy of all parts of the House. Under the first sub-section, it was possible to impose a penalty on the Companies in cases of breach of statutory duty; but there were a certain number of cases which were not within the penalty imposed by that sub-section, but which yet deserved to be dealt with. One might contemplate cases where there was no breach of statutory duty, and yet a company might be to blame; and he suggested that in these cases a penalty ought to attach. For instance, where the Water Companies were exempted, under the existing law, by reason of the fact that failure to supply water had arisen from frost or unusual drought, the statutory duty fell to the ground. The Companies were exempted from all obligation; yet they might be negligent. Suppose unusual drought, and suppose it was possible for a Company to obtain a supply by connecting their mains with those of another undertaking; if they failed to do so, it would be held to be negligent, and if, in consequence, any disease broke out in the district, that would be a very proper case for imposing a penalty. He submitted, therefore, that the amendment was not unnecessary; and he suggested also that it would not be difficult to work.

Mr. CHAPLIN pointed out that under the Railway and Canal Traffic Act there was power for the Railway Commissioners to award damages and impose penalties for non-compliance with any orders that might be made by them. Not only so, but under the Metropolis Water Act, 1852, they could impose fines of £200, with a further fine of £100 for every single month during which these orders remained unfulfilled. These powers appeared to be ample to enforce the law as it stood. The amendment went a great deal farther than anything contemplated in the present Bill, and involved an entirely new departure; and it was totally unnecessary for the purpose in view.

Mr. BUXTON said in his judgment the Bill as it stood was very inadequate; and he thought the amendment proposed was a reasonable one.

Mr. PICKERSGILL expressed a similar opinion.

On a division, the amendment was lost by 110 votes to 190.

Lord H. CECIL then moved to insert the following proviso in clause 1: "Provided that, in awarding damages under section 12 of the Railway and Canal Traffic Act, 1888, to an aggrieved party, the Commissioners shall have regard not only to any pecuniary loss such party shall have sustained, but also to the injury or danger to health, the nuisance, and the inconvenience to which such party shall have been exposed by reason of a bad or deficient supply of water." He explained that this amendment was complementary to the other, but more moderate in character. The President of the Local Government Board had explained that, under the Bill as it stood, power was given to the Railway Commissioners to award damages under section 12 of the Railway and Canal Traffic Act; but, on perusal of that section, he thought it would be seen that pecuniary loss only was contemplated. Of course, this was not by any means the most important injury inflicted by a defective supply of water; and, section 12 being nugatory, as it practically would be in connection with the provisions of the Bill, he proposed to add a proviso to show that damages were to be awarded for injury of any kind caused by a defective or bad supply of water. The amendment only substituted the expeditious method provided by the Bill for the recovery of damages which under the ordinary administration of the law were usually compensated for by action. It did not in any degree whatever add to the burdens the Water Companies had at present to bear; nor did it propose to alter their statutory duties. It was merely intended to make the Bill practically effective. He strongly urged on his right hon. friend and on the Water Companies that this kind of amendment was in their own interest.

The SOLICITOR-GENERAL expressed the hope that the Committee would not accept the amendment. His noble friend seemed to think that if it were adopted it would alter the general law with regard to proceedings against Water Companies for damages. If this were the case, the Bill certainly would not be a proper means for introducing a special enactment of the kind. The whole scope of the measure was to provide better machinery for enforcing rights and liabilities already existing. He did not read the power to award damages under the 12th section of the Railway and Canal Traffic Act as being confined to pecuniary losses. That power was based on those principles of common sense which he hoped he was not unduly sanguine in thinking underlay English common law. He thought the amendment was unnecessary.

Mr. BUXTON doubted whether any consumer who had taken action under the existing law, and had not been able to prove monetary loss, had been awarded pecuniary damages. It was desirable to make it quite clear that actual pecuniary loss was not the only damage to the consumer for which the law provided. According to the Solicitor-General, the amendment would not add to the existing law. If this was correct, it ought still to be inserted in the Bill as declaratory of the law, so that the consumer might learn that he possessed rights of which he was at present unaware.

Mr. HOLLAND supported the amendment, on the ground that the intention of the law, as declared by the Solicitor-General, ought to be made quite clear.

Mr. BIRRELL said in his opinion the amendment was mere verbiage, and would encumber the Bill with a layman's views on the subject. The points put by the noble Lord were met already by the existing law.

Sir J. BRUNNER and Mr. HOPKINSON supported the amendment.

Colonel HUGHES reminded the Committee that a deficiency in the water supply might be caused by frost. If the amendment were carried, the Water Companies would be held responsible for many things over which they really had no control.

Lord H. CECIL said the very fact that the Government opposed the amendment convinced him that it would make a difference in some way or another. If it did not matter whether the amendment were passed or negatived, why had the Government wasted time in opposing it? The fact was that the amendment would cover cases which ought to be met, but which the existing law did not provide for. The Government seemed prepared to deny the people who really suffered proper damages, which they themselves had not the courage to affirm were improper damages. It was on this issue that they were going to divide.

The Committee then divided, when the amendment was lost by 108 votes to 192.

Mr. BUXTON moved the following addition to clause 1: "In any proceedings under this Act, before the Railway and Canal Commission, the costs shall not exceed the limits prescribed by the Commission."

The SOLICITOR-GENERAL assured the hon. member that the amendment was altogether unnecessary, as the costs were in the discretion of the Commissioners, and would be so in any application under the Bill. These costs would be taxed in the ordinary way by the Taxing Master, who was most competent to say what were fair charges.

Mr. BUXTON, after this assurance, withdrew his amendment.

The amendment was accordingly withdrawn and clause 1 passed.

The Committee proceeded to consider clause 2, which is as follows:

A local authority may aid any water consumer in obtaining the determination of any question which appears to the local authority to be of interest to water consumers with respect to the rights, duties, and liabilities of any of the Metropolitan Water Companies, or otherwise with respect to the supply of water given and the charges made by the Metropolitan Water Companies; and may take such legal proceedings as appear to the local authority necessary or expedient for the protection of the interests of water consumers with respect to the matters aforesaid.

Mr. Boulnois had given notice of amendments to insert after the word "may," in the first line, the words "with the sanction of the Local Government Board," and after the word "consumer," the words "within the district of such local authority;" and to make necessary alterations of text farther down. Mr. Lough also proposed two amendments.

Certain verbal changes were agreed to; and the clause was under discussion at half-past five o'clock, when the debate stood adjourned.

The following further progress has been made with Bills:—

Bills read a second time: District Councils (Water Supply Facilities) Bill, Gas Orders Confirmation Bill (No. 2).

Bills reported: Belfast Water Bill, Harrogate Corporation (Water Transfer) Bill, Harrogate Water Bill, Newhaven and Seaford Water Bill [preamble not proved], Tynemouth Corporation Water Bill.

Bills read the third time and passed: Deal and Walmer Water Bill, Leicester Corporation Bill, Malvern Link Urban District Gas Bill, Manchester Corporation Bill, Newport Corporation Bill, Salford Corporation Bill.

HOUSE OF COMMONS COMMITTEE.

Monday, June 28.

(*Before Colonel* GUNTER, *Chairman*, *Sir* R. HANSON, *Mr.* S. WOODS, *Mr.* A. HUTTON, *and Mr.* BONHAM-CARTER, *Referee.*)

ST. ANNE'S-ON-THE-SEA GAS BILL.

By this Bill, which had been considered by a Committee of the House of Lords,* provision was made for the acquisition of the undertaking of the St. Anne's-on-the-Sea Gas Company by the Urban District Council, and for authorizing the Council to supply gas within their district.

Mr. BALFOUR BROWNE, Q.C., Mr. J. D. FITZGERALD, Q.C., Mr. WEDDERBURN, Q.C., and Mr. ROE RYCROFT appeared for the promoters;

* See "JOURNAL," Vol. LXIX., p. 595.

Mr. PEMBER, Q.C., Mr. WORSLEY TAYLOR, Q.C., and Mr. CLAUDE BAGGALLAY represented the Company.

Mr. BALFOUR BROWNE, in opening, briefly stated the object of the Bill, and said there were a number of cases in which Bills for the compulsory purchase of gas companies' undertakings had been promoted and passed; and he instanced those of Rotherham, Ilkley, and Matlock Bath. It had always been the policy of Parliament to place the supply of gas as well as of water with local authorities; but, apart from this, he held that the circumstances of this particular case justified the Committee in expropriating the Company, on payment of fair and full compensation, and handing over their undertaking to the Local Authority. The Public Health Act of 1875 gave power to a local authority to supply gas and also to purchase, without any Act of Parliament, the works of a gas company in their own district, provided the company was not a statutory one. The Local Authority in the present case could not, however, proceed under the Public Health Act, first because a portion of the undertaking was outside their district, and next because the Company had to a certain extent statutory powers. The Company was formed in 1875; and in 1876 they obtained a Provisional Order in the customary form, except that the Company seemed to have obtained absolutely no authority for borrowing. He contended that their total capital powers were contained in the Order, and that they had no power to raise anything beyond the £15,000 mentioned therein. The contention of the Company, and the one on which they acted, was that, having been formed as a limited Company, they had absolute authority, notwithstanding that there was no mention of borrowing powers in the Order, to borrow as much money as they chose. As a matter of fact, in 1876 they increased their capital from £15,000 to £23,105. If a company was to have borrowing powers under a Provisional Order, this was always clearly stated; and as it was not mentioned, it was clear the Company were not intended to have it. The increase of the capital to £23,105 was not registered until 1896—a fact which, if the Company were a joint-stock undertaking, would render them liable to penalties of about £30,000. Counsel went on to refer at length to the Bills under which Blackpool acquired portions of the Company's property, and to the petitions of the Company in opposition thereto, in which petitions it was carefully pointed out that the portions which Blackpool required were the remunerative parts of the Company's district, and that the remainder, which was the St. Anne's district, was, and would remain, unremunerative. He thought the opposition of the Company would be found, as in the case of Blackpool, to be merely a matter of price; but he was not able to inquire into this question, because the Company had refused to allow the Local Authority's Engineer to inspect the works. The Council had always been very desirous of purchasing the undertaking; the subject having been first mooted in 1891. Having gone through the correspondence which had passed between the parties, Counsel said the negotiations were broken off merely because the Local Authority wished to appoint somebody to value their works. The Company, he maintained, had acted illegally in many respects—indeed, it was difficult to find any of their acts which were not illegal. They had shown that they knew the increase of the capital beyond the £15,000 was illegal, by correspondence which had since passed with the authorities at Somerset House. As to whether or not they had power to raise the extra capital, the Courts of Law would probably have to determine; and he distinctly asserted that they had not. The Company had raised a further £10,000, which they had no power whatever to borrow. Then they had traded unsuccessfully; and to make both ends meet, they borrowed £5350 from a local Land Company, whose members were to a large extent the same as those of the Gas Company, and after a time converted this sum into a contingent rent-charge, as if it had been fair capital. In respect of this sum, they paid £268 10s. yearly to the Land Company. This was distinctly illegal, and formed a burden which the gas consumers had to bear. Other illegalities to which Counsel alluded were the keeping of the accounts in an unsatisfactory form, and the creation of preference shares. A poll had been taken of the town on the question of purchase, when 262 voted for, and 231 against it; the rateable value represented by the majority being £8522, and by the minority £5110. Since the poll, the facts had become known; and public opinion had grown very much in favour of purchase. This was shown by a petition presented in favour of the Bill, which was signed by a number of persons who had previously voted the other way. The Company were not, he asserted, unwilling to sell; they were only unwilling to sell at this particular juncture. He could not help thinking that they knew they had been acting illegally, and that the delay they wanted was to give them time to set the illegalities right—perhaps by a Bill next year; or, if this could not be done, to put as long an interval as possible between the commission of the illegalities and the time when they came to be inquired into. If all the acts referred to were legal, under the present Bill the Company would get their full value; if they were not, the acts would not be allowed for. Among the grounds of complaint against the Company was the high price of gas—viz., 4s. 6d. per 1000 cubic feet—as compared with 2s. 4d. at Blackpool (a much bigger place, it was true), and with 2s. 10d. at Lytham, which was only a slightly larger town; the supply in both cases being in the hands of the Local Authority. In conclusion, the learned Counsel briefly dealt with the petition presented by the Gas Company, much of the contents of which had been already touched upon.

Mr. *R. Shepherd*, the Chairman of the St. Anne's District Council, examined by Mr. FITZGERALD, gave evidence as to the proceedings in the Council and in the town with reference to the purchase of the Gas Company's undertaking. He said he owned between 30 and 40 houses, of about £15 a year, in St. Anne's; but though he had had gas-fittings put into them, the majority of the tenants used oil—the price of gas being prohibitive. The consumers generally were rather few. The price was 4s. 6d. per 1000 cubic feet, with a rebate of 3d., as compared with 2s. 4d. at Blackpool (which was farther from the coal-fields than St. Anne's), and 2s. 10d. at Lytham.

Cross-examined by Mr. PEMBER: The Company at one time lowered the price of gas to 3s. 6d.; and he agreed that this did not bring a great increase of consumption. St. Anne's was quite a modern place, and only came into existence a year before the Company started. For a time it languished, and the Gas Company and the Land Company were the only two undertakings that struggled on.

Mr. PEMBER: Without discussing the question of the legality or illegality of the way in which certain bits of capital were raised, do you not think it rather hard that you should seize upon the exact moment when the Company are going to get a dividend to buy them up?

Witness: It is a matter of opinion.

But I want yours?—I do not think it hard, if they get a fair price. Of course, we may buy the undertaking cheaper now than later on.

Mr. *T. Bradley*, Clerk to the St. Anne's District Council, examined by Mr. WEDDERBURN, laid before the Committee a quantity of figures relating to the population, rates, loans, &c., in town; the balance of borrowing powers unexercised now being £38,000. The smallness of the majority in favour of purchase when the poll was taken was due to some forty of the outlying farmers, whose premises were not connected with the mains, and who were tenants of the Land Company, voting against the proposal. There was also some fear that the purchase would mean an increase in the rates. Since the present Bill was in the House of Lords, two petitions had been prepared in favour of purchase—one signed by 34, and the other by 94 owners and ratepayers. The effect of these figures, if applied to the poll, would be to increase the majority of 31 to 246. Of the 123 shareholders of the Gas Company, only five resided in St. Anne's; and the Directors also chiefly lived elsewhere. There had been constant complaints to the Council as to the high price of gas; but the communications made by them to the Company had produced no good result.

Cross-examined by Mr. WORSLEY TAYLOR: Recently there had not been any complaints as to the gas. He believed the shareholders had not had any return whatever on their shares.

By Sir R. HANSON: There had been no written complaints by the Council as to the quality or quantity of the gas; only as to the price.

Mr. *R. Peel*, a member of the St. Anne's District Council, and an Alderman of Bury, in reply to Mr. RYCROFT, said the price of gas at Bury was 2s. 2d. per 1000 cubic feet. There was no reason why gas should not be supplied as cheaply at St. Anne's as at Lytham.

Cross-examined by Mr. PEMBER: He agreed that 18-candle gas was a good quality. The maximum price chargeable under the present Bill would be 4s. 6d. per 1000 cubic feet.

By the COMMITTEE: Owing to the high price, he only used gas to light his lobby; but it was poor stuff.

Mr. *S. Wilson*, examined by Mr. WEDDERBURN, said he was a joiner, builder, and contractor at St. Anne's. He had an 8-horse power gas-engine, and for the gas it consumed he paid £50 or £60 a year; the rate for business purposes being 4s. 6d. per 1000 cubic feet, with a reduction of 9d. if payment were made within a month. As far as his knowledge went, he did not think there had been a man with gas-managing experience in charge of the works.

Mr. *W. Reed*, a plumber and gas-fitter of St. Anne's, thought the concern would be much better managed by the Council than by the Company. He had received complaints as to the bad quality of the gas, which he thought could be supplied much more cheaply.

Mr. *C. A. Myers*, examined by Mr. FITZGERALD, said he was Manager of the Lytham Gas-Works, which were owned by the District Council. The price charged was 2s. 10d. per 1000 cubic feet to private consumers, and 2s. 6d. for the public lamps. The Council had by various reductions lowered the price from 5s. in 1881 to 2s. 10d. in 1895. When the make of gas in Lytham was about 19 million cubic feet, which was what it now was at St. Anne's, the price was 3s. 3d. The population of Lytham then was between 3000 and 4000. The capital expenditure on the Lytham works was £19,750, of which £5750 had been paid off out of profits. There was also a sinking fund, which amounted to £1768. Deducting both of these items, left the capital at £12,232.

Cross-examined by Mr. WORSLEY TAYLOR: He would not say that Lytham was a fair comparison with St. Anne's; but the price at the latter place should not be so high. The local circumstances had to be considered. He acknowledged that the mileage of main compared with the sale of gas had everything to do with this matter.

Mr. WORSLEY TAYLOR: Are you aware that at Lytham you have eight miles of mains with a sale of 30 million cubic feet of gas?

Witness: Yes.

And that at St. Anne's you have 14 miles of mains with a sale, roughly speaking, of about 20 million cubic feet—absolutely different, is it not?—I do not know the facts as to St. Anne's.

If I am right in my figures, are not the main factors absolutely different?—Yes.

Re-examined: The consumers were getting the benefit at Lytham of the capital being written off. No capital was being written off at St. Anne's.

Mr. *E. H. Stevenson*, M.Inst.C.E., examined by Mr. FITZGERALD, said that for some years after the formation of the St. Anne's Gas Company the quantity of gas made was exceedingly small. In 1880, the capital was nearly equal to £11,000 per million cubic feet of gas sold, which was simply enormous. It was largely in consequence of extravagance in their early days that the Company were obliged to keep up the price of gas. The works were about half a mile from the railway; and the extra expense of cartage thus necessitated added to the cost. He had looked through all the balance-sheets, and from first to last found grave irregularities, which rendered the Company liable to considerable penalties. [Witness was taken through the various items of capital which had been raised, as he held, illegally.] If the position of the Company was legal, they had unlimited borrowing and capital powers. He did not know of any case where a gas company had unlimited borrowing powers. If a company had them, they would be able to borrow money from their own shareholders, and in that way divide much greater profits than were allowed. The capital expended was very large. It worked out now to £1482 per million cubic feet of gas sold, which was very high. In 1879, the Company created, or purported to create, 7 per cent. preference shares; and as this rate was insufficient to produce all the money they wanted, they increased it to 10 per cent. when they raised more preference shares in 1885. The latter was a very uncommon rate; 5 or 6 per cent. being the usual figure sanctioned by Parliament.

Tuesday, June 29.

Mr. *E. H. Stevenson*, in further examination by Mr. FITZGERALD, said it appeared from the Company's balance-sheet for the year ending

Dec. 31, 1895, that the loss on revenue to that date was some £3500. This the Company capitalized, as if it were an asset, by the creation of a rent-charge; and to this extent their capital had been increased beyond the amount Parliament had sanctioned. The rent-charge was calculated at 5 per cent., and amounted to £268 10s. If this were a legal operation, no company need go to Parliament again, because they could always borrow money, create a rent-charge, write it off the capital account, and use the money again to extend their works and plant. The 5 per cent. would come from the consumers if the Company were paying their maximum dividend; at present it came from the shareholders. The charge for gas in St. Anne's, considering the size of the place, was higher than in any other town in Lancashire. So far as England was concerned, there were only four other statutory companies—all of them far removed from coal-fields—of about the same size as the St. Anne's undertaking, who charged as much. The concern was not at all economically worked, as was shown by the fact that at Lytham, where the circumstances were very similar, the cost per 1000 cubic feet of gas sold, exclusive of coal, was 12·83d., whereas at St. Anne's it was 16·8d. If the works were transferred to the District Council, he should anticipate an almost immediate reduction in the price of gas; one reason being that the Council could borrow money at a lower rate than that at which they would probably have to buy the undertaking. The Council would buy on about a 4 per cent. basis; and they could borrow at 2¾ per cent. The first year after the purchase, there would be no amount to put aside for the sinking fund; and the natural increase after an undertaking became vested in a local authority was usually so much greater than it was in the hands of a gas company, that the concern, even supposing the Council could only borrow at 3 per cent., would at the end of the first year have overtaken the difference between 4⅓ and 3 per cent.—the extra ⅓ per cent. being for the sinking fund. Experience showed that, after their transfer to a local authority, gas undertakings required no assistance either from an increase in the price or from the rates, but that a reduction in the charge usually followed. The provision added to the Bill in the House of Lords—that the arbitrator should allow the full and fair value of the works—ensured that whatever he found to be their value the Company would be entitled to receive, whether the money represented by them had been spent legally or illegally.

The Chairman: Do you know many cases where, when such works have been purchased, the business has been sold by the value of the works and not on the profits?

Witness: No, Sir; I do not know of one. But there has never been a case like this before. It is unique in every respect.

The concern has always been sold on so many years' purchase of the profits?—Yes, when the matter has gone to arbitration. There have not been many cases where gas-works have been transferred compulsorily from gas companies to district councils.

In further examination, witness said the present capital expenditure of the Company worked out at £1482 per million cubic feet of gas sold, whereas it should be £600 or £700. The average throughout England was only £633.

Cross-examined by Mr. Baggallay: In previous cases where gas undertakings had been transferred to local authorities, the ordinary shareholders had had some return; but in the present instance they had not received anything. In the last few years, the Company had nearly cleared off the arrears of dividend on the preference shares. If the Local Authority were to purchase now, they would acquire a concern which was becoming what one might call thoroughly prosperous; but this would not affect the purchase value, because they were earning sufficient to pay the full 10 per cent. payable on the ordinary shares, though this money was swallowed up to clear off the arrears of dividend on the preference shares. There was no complaint of the quality of the gas supplied; it was of the kind common in Lancashire—viz., 18 or 19 candle power, which was more than Parliament required. Witness was examined at some length to show that the capital expenditure of the Company at the inception of the undertaking was not excessive, having regard to the fact that no one knew what St. Anne's was going to develop into; but he held that the expenditure was much higher than was reasonable or proper. The Company's total share capital issued amounted to £14,600.

Mr. Baggallay: Whether or not the Company have on paper created more than £15,000, they have not issued more than this amount of share capital?

Witness: Quite so—of share capital.

If the Company have not issued more than £15,000, in what way are any of the consumers or the Local Authority hurt by their having made a paper creation, which, added to the capital issued, brings the amount up to more than £15,000?—So far as it simply relates to their issued share capital, nobody is any the worse.

By the Chairman: More money would certainly have to be raised before long, as the place was growing. Money could be more cheaply borrowed by the Local Authority than by the Company.

By Sir R. Hanson: If he had been called in to advise the Company in 1884 or 1885, when it was obvious that they had built much larger works than St. Anne's then required, he should certainly have recommended them to go to Parliament at once to sanction their expenditure of borrowed money.

Re-examined by Mr. Wedderburn: If they had attempted to put their accounts in statutory form, their attention must have been called to the illegalities of which they were guilty, because they would have had to fill up a column of authorized loan capital. Though the growth of St. Anne's had suffered checks, the consumption of gas had steadily increased.

By Mr. Hutton: The total amount of the loans at present was £15,370, which included the rent-charge. The chief extravagance and indiscretion of the Company lay in the large capital expenditure of £11,443 at the start, when practically they sold no gas. They should only have spent £3000, or at most £4000. If they had not been over-capitalized at the outset, they would not have had to borrow so much money, which was what had brought them to their knees.

By the Chairman: When he referred to bad management on the part of the Company, he meant that the gas cost too much. They were in a good state at present; and this year they would probably pay a dividend on the ordinary shares. When the ordinary shareholders received their dividends, the price of gas would probably be reduced to the consumers in the course of time. If the District Council had the undertaking, the charge would most likely come down more quickly and to a greater extent. In place of the 4s. 3d. at present charged, he thought a fair figure would be 3s. 3d. The Company had had considerable difficulties to contend against. They were now beginning to feel their feet, and, if allowed, would no doubt go on. But no one could tell whether they would go on legally, or as they had done in the past.

Mr. *W. R. Chester*, M.Inst.C.E., in reply to Mr. Rycroft, said he had examined the Company's works so far as he could; permission to view them internally having been refused. His evidence was largely corroborative of that of the last witness. If the undertaking were in the hands of the Local Authority, gas could almost certainly be supplied more cheaply, because they could raise money on better terms than the Company, and would save dividends and secretarial charges. The proportion of gas consumers to inhabitants in St. Anne's was very small.

By the Chairman: A reasonable price for gas at St. Anne's would be from 3s. to 3s. 3d. per 1000 cubic feet.

Mr. *J. Beckett*, Borough Accountant to the Accrington Corporation, in reply to Mr. Wedderburn, gave evidence in regard to the financial arrangements of the Company, which had been largely dealt with previously. The charge of £1154 for law and other expenses in connection with the Provisional Order was very excessive; he had known such Orders cost £250, but not more. It appeared that in 1884 the Company were borrowing not only on capital account, but for revenue purposes. They were now on the verge of prosperity. This year they would probably clear off all the arrears on the preference shares, and divide something among the ordinary shareholders. The Company had paid dividends without deducting income-tax; so that the shareholders had received the income-tax in addition to the dividend. It seemed from the accounts that the income-tax was also paid to the Government authorities.

Mr. Pember (in cross-examination): Is not the sole object you have in coming here at the present moment to buy up the Company before we become really prosperous and valuable?

Witness: I do not think so.

This closed the case for the promoters.

Mr. Pember, in addressing the Committee, said the promoters held that the trouble of the Company arose from the fact that they were too ambitious. But, having regard to the prospects of the place, as judged by other towns in the vicinity, he contended that this was not so. At first all went well; then the place hung fire, and the Company passed through very troublous times. Now, just as their prosperity was about to commence, the fact that they made ample provision for the growth of the place was urged as a reason why their undertaking should be compulsorily acquired. As to finances, he explained that the Company was incorporated under the Act of 1862, and they subsequently obtained a Provisional Order. In this there was no mention of borrowing powers; but that surely did not interfere with, or take away, those they possessed under the previous Act. As to the issue of preference shares, Counsel stated that the Company had tried to get the money at 7 per cent.; and it was only when they failed to do so that they issued the shares at 10 per cent. Even supposing this was illegal, they had not, he asserted, exceeded the £15,000 which undoubtedly they were authorized to issue. He thought they would find that at the utmost there was only a sum of between £2000 and £3000 which the books would show had been regarded as capital account, but which, according to the proper and modern system of book-keeping, should have been treated in the revenue account. Considering all the difficulties of the Company, if this was the total of their wrong-doing, was it a reason for treating the Company in the way proposed? With regard to the loan of £6000 from the Land Company, if they had left this alone, interest would have steadily accumulated from 1884 to 1893, if an arrangement had not been come to by which the Gas Company were to pay down one-sixth in cash and convert the balance into a rent-charge at 5 per cent.—the interest not to be paid until it was earned. This undoubtedly saved the Company the payment of nine years' interest, which would have been a very considerable sum. The arrangement was undoubtedly the best that could be made under the circumstances. Was it not a terrible thing that, having passed through all their difficulties, and just as they were entering on, as they hoped, a long career of prosperity, this proposal to purchase should be made; the avowed object being to make it at a lower price than would be obtainable in a few years' time? In conclusion, he undertook that, inasmuch as the legal position of the Company was unusual—he referred particularly to their unlimited borrowing powers, and their not being under ordinary parliamentary regulations—the Company should come next year with a Bill to put their house in modern order; and when they had done this, everyone of the questions now raised would be thoroughly gone into.

Wednesday, June 30.

Mr. Baggallay this morning shortly addressed the Committee with reference to certain preceding cases in which gas undertakings had been compulsorily acquired. He said Mr. Stevenson had told them that in all instances where compulsory sale of gas undertakings, or anything in the nature of it, had been effected, the companies were at the time declaring dividends. In the present case, the Company, as regarded the ordinary shareholders, were not yet paying dividends, though they would probably do so during the year. If companies, in the absence of any serious complaint against them which would do injury to the consumers, were to be bought up before they reached the dividend-paying stage, it would prove seriously detrimental to enterprise in the establishment of undertakings of this kind. Counsel then briefly reviewed the various precedents cited; asserting that the only case of clear compulsory purchase of a gas undertaking was that of Rotherham in 1870, in which very serious allegations as to the quality of the gas were proved. This case was not comparable with that of the St. Anne's Gas Company, because no complaint as to the quality of the gas had there been made.

Mr. *W. Cash*, in reply to Mr. Baggallay, said he had thoroughly examined the books and accounts of the St. Anne's Gas Company. The whole of the capital expenses amounted to £29,667, to which must be added the cost of public lamps, £762—making a total of £30,429. From this he deducted £3255 in respect of the portion of the undertaking sold to Blackpool; leaving £27,174. All the items charged to capital had been properly so charged, with the exception of £341 15s. 6d., a portion of the law costs and expenses of formation which should have been charged to revenue. Deducting this sum left the actual capital expenditure at £26,833. The total of the law and formation expenses was £1243, made up of £341 as above; law charges on the incorporation of the

Company, £289, including £240 in respect of the Provisional Order; and expenditure during construction, £612. The cash advanced by the Land Company to the Gas Company was £5488 under the head of capital items. This was increased by interest, rent, and other charges, and reduced by work done and sundry payments made. The £5370 treated as consideration for the rent-charge was properly so treated. The aggregate arrears in respect of dividends on Dec. 31, 1885, when the account with the Land Company was closed, was £6924, which was subject to a slight deduction for interest on calls paid in advance. The contingent rent-charge did not become a charge on the undertaking for nine years. This transaction was equivalent to raising £5370 of capital at a trifle over 3½ per cent., and this at a time when the public would not subscribe to the Company on the promise of 10 per cent. interest. It had been beneficial both to the consumers and to the Company. This money was rightly treated as capital. In 1880, £5000 was borrowed from Mr. James Taylor at 5 per cent.; but in 1881, when money was cheaper, the Company raised on loan £5000 at 4 per cent., and paid off Mr. Taylor, saving 1 per cent. in the interest. At the present time all the borrowed money of the Company stood at 4 per cent.; and the existing debentures were all terminable at periods varying from 2 to 28 years. With reference to the payment of dividends and income-tax, he said the books showed that the tax had always been paid in the usual and proper way. There had been exceptional charges against revenue in 1894, 1895, and 1896, amounting to £1300, in respect of retort-benches, purifiers, &c. The expenses of management were very small. In 1896, when they were larger than ever before, the total, including Directors' fees, Secretary, office expenses, salaries, and wages, was only £309. Now the Company were clear of their difficulties; and at an early date they would be able to pay some dividend on their ordinary shares, besides clearing off absolutely all the arrears on the preference shares. Last year the profit amounted to more than £2000. In his opinion, the Company, so far as he had seen from the accounts, had done their very best under the circumstances in which they were placed financially. They had undoubtedly very exceptional difficulties to contend with, and had done all they could to surmount them in a way which had not been injurious to the consumers. In this they had succeeded. In a technical sense, there had been irregularities in keeping the accounts, but none had been to the injury of the consumers. It would not be just to take the present income as a fair basis for purchase, because it was increasing, and in a very few years it would be considerably greater.

Cross-examined by Mr. FITZGERALD: The profit last year being £2000, even supposing the Company were entitled to put the rent-charge against the consumer, they were in a position to pay a full dividend on all their capital. An arbitrator would have no difficulty, therefore, in ascertaining the present value of the concern. If, however, the Company were allowed to go on for (say) five years, they would get a larger price in the arbitration. This was a question of prospective value—one of the things which an arbitrator always took into consideration when making his award. The Company had a share capital of £15,000, and they had borrowed further money to the extent of more than £15,000. He did not know of any company who had borrowed as much as their share capital, or of a company who had borrowed without the power to do so being contained in their Provisional Order. The arrears of dividend on the ordinary capital now amounted to £13,000. It was within the legal rights of the Company not to reduce the price of gas until all this money had been paid; but they would not be likely to exercise the right. They would probably reduce the price before the arrears were all cleared.

By the REFEREE: If the Company attempted to pay a large amount of back dividends without reducing the price of gas, there would be an outcry before which they would have to bend.

The CHAIRMAN: If a large sum were given for the undertaking, is there any reason to consider that the purchasers, who would be the District Council, would be able to reduce the price of gas much?

Witness: It is difficult to say in this case, because everything depends on the price they have to pay for the property. If the arbitrator made them pay a long price, then, having to provide interest on the borrowed money, and so forth, I do not see how they could do it.

Supposing the Company go on, do you consider they will be in a position to reduce it?—Yes; I think so.

Mr. *W. H. Nutter*, examined by Mr. BAGGALLAY, said he was the Secretary of both the St. Anne's Gas Company and the St. Anne's Land and Building Company, and had been so for the last 21 years. He gave at considerable length the history of the former Company, the main features of which had already been laid before the Committee. As to the creation of the rent-charge, he asserted that this arrangement had to be made to enable the Company to issue the 10 per cent. preference shares, in order to raise further necessary capital. Several persons who intended to take shares required some arrangement to be made regarding the debt to the Land Company before they would do so.

Mr. BALFOUR BROWNE (in cross-examination): If the arbitrator gives you full value for the undertaking, and the prospective value and arrears, how will the shareholders be damaged?

Witness: It will all depend on the amount.

If you to-day got your price, "the amount," you would be quite willing to sell to us?—I do not know what the Directors would do.

In further cross-examination, witness said no doubt the Company would soon reduce the price of gas. He could not say whether they intended to pay up all the back dividends.

By Sir R. HANSON: The price of gas should most decidedly be reduced before any arrears of dividend on the ordinary capital were paid.

Mr. *Corbet Woodall*, M.Inst.C.E., in reply to Mr. BAGGALLAY, said, with regard to Mr. Stevenson's contention that the Company had been grossly extravagant at the outset in capital expenditure, this was disproved by the fact that they had had already to take down and reconstruct a portion of the works because they were too small. From the Council's point of view, he thought they were rightly advised that the present was the proper time to purchase the gas undertaking, because the amount realized by the Company would probably be less now than in years to come. There was nothing in the capital arrangements of the Company which could not be adjusted by a Bill next session. Having regard to the circumstances of the Company, he did not think the price now charged for gas was extravagant; nor did he see any reason whatever why, if the Company were left alone, they should not at an early date be able to make a reduction. The works were in admirable condition, and at an expenditure of only £5000 or £6000 they could accommodate an increase of business of 50 per cent. It was a mistake to suppose that the consumption of gas increased more quickly when the supply was under a local authority than under a company.

Cross-examined by Mr. BALFOUR BROWNE: If the Company came next year with a Bill, the auction clauses would certainly, and the sliding-scale might, be put upon them. He could not say that if the sliding-scale were imposed every penny of back dividend would go; but he hoped not.

This closed the case for the Company.

Mr. BALFOUR BROWNE then addressed the Committee in reply; asserting that there was no reason why in this case they should depart from the decision of the House of Lords, and do what, so far as his knowledge went, had never yet been done—namely, reject a Bill for compulsory purchase. By coming next year to Parliament, the Company wanted, as he believed, to turn their illegalities into legalities, and thus obtain in the arbitration proceedings as to the purchase price a larger sum than they would now get. The general policy of Parliament was that the supply of gas should, as a sanitary necessity, be in the hands of local authorities; and he asserted that the present was a case, if ever there was one, in which a purchase should be sanctioned. As to the precedents cited, he contended that they were amply sufficient to justify this course being followed.

The CHAIRMAN, after consulting with his colleagues, but without clearing the room, said the Committee were of opinion that the preamble of the Bill had not been proved.

HOUSE OF COMMONS COMMITTEE.

Monday, July 12.

(*Before Sir* W. CODDINGTON, *Chairman*, *Mr.* CUBITT, *Mr.* COURTENAY WARNER, *and Mr.* LAMBERT.)

HARROGATE WATER BILL.

This Bill, which is to confer further powers upon the Harrogate Water Company for the construction of works and the raising of capital, came before the above-named Committee to-day.

Mr. PEMBER, Q.C., Mr. CLAUDE BAGGALLAY, and Mr. LLOYD, appeared for the promoters; Mr. BALFOUR BROWNE, Q.C., for the Harrogate Corporation; and Mr. FREEMAN, Q.C., and Mr. FREERE represented Sir H. Day Ingleby, a landowner affected by the Bill, who petitioned against it mainly on the ground that the compensation water to be supplied to his estate under the Bill was insufficient.

Mr. PEMBER, Q.C., in opening the case, sketched the history of the undertaking. He showed that the Company obtained their first Act in 1845, and having described the character of the works, he pointed out that the population of the town in those days was only some 6200. After the expiration of ten years it had only increased by about 1300—that was to say, to 7500.

Mr. BALFOUR BROWNE, in opposition, said that he represented the Harrogate Corporation, who proposed under the Bill which stood next in the list to come before the Committee to acquire the undertaking of the Water Company. It was compulsory in its provisions; and therefore the two measures were, to some extent, antagonistic. In one sense, however, that was not the case, because, even if the Corporation Bill passed, some further extension of the water-works would be necessary. The works proposed to be constructed under the Bill before the Committee seemed to be well designed to meet that want; and therefore it was not necessary to oppose the preamble of the Bill. But he would ask that clauses should be inserted for the purposes of the Transfer Bill. The fact he would ask the Committee to bear in mind was that, if they passed the Corporation Bill transferring the water-works as now existing, any future works would also be transferred. He would ask the Committee to hear his case before dealing with the clauses of the Bill.

Mr. PEMBER said he did not see how it could carry the matter of transfer further. He understood from his learned friend's remarks that, in the event of transfer, it would be necessary that some clauses should be inserted in the Bill before the Committee. He desired to have his Bill dealt with as far as possible.

Mr. FREERE said that his client, Sir H. D. Ingleby, ought not to be kept there until after the Corporation Bill had been disposed of, and thus be put to considerable needless expense.

Mr. PEMBER, continuing his opening statement, said that the growth of Harrogate up to 1862 was not rapid, mainly owing to the lack of railway communication. The North-Eastern Railway Company had no station in the town; the station for Harrogate being Starbeck. In 1862, however, a new line was made into the town, which then began to progress rapidly. Owing to this growth of the town, the Water Company went to Parliament to obtain powers to raise new capital to the extent of £28,000—£16,800 of ordinary, and £11,200 of 5 per cent. preference shares and £6000 further borrowing powers. The works of 1869 included a new reservoir, with channels, aqueducts, and tanks, which were now in full use. Owing to the continued growth of the town, the Company were again forced to increase their works; and in 1880 they obtained a Provisional Order enabling them to raise £40,000 additional capital, and to borrow £10,000 more, for the purposes of acquiring land and constructing further works. Again in 1896, a similar state of things having arisen, the Company were compelled to come to Parliament; and hence the present Bill. No one questioned the necessity for the proposed works or opposed them. The Corporation, though desirous of acquiring the undertaking, approved of the extensions, knowing them to be necessary, and well designed to afford the required increased supply. The capital to be raised under the Bill was £72,000 in shares, with borrowing powers of £18,000. Auction clauses for the protection of the consumers were inserted, to meet the wishes of Parliament. It was proposed to construct a new reservoir—the Scargill reservoir—to be formed by placing an embankment across the Scargill Beck, and raising the height of the Bearer Dyke reservoirs. It appeared that the leaden pipes running into the consumers' houses—not the Company's pipes—had a deleterious effect on the water; and Parliament had thought it desirable

that this should, if possible, be prevented. The water was, therefore, passed through a filter of silica, which was believed to coat with silica the infinitesimally small globules of water, and thus prevent the lead acting on it. This was an interesting chemical fact; and the Bill provided that the water supplied should be treated in this or some other manner, for the protection of the consumers against the action of lead on the water. Three years was allowed in the Bill for the purchase of land; and ten years for the completion of the works, provided that within this period it was not necessary to make the embankment of the reservoir of greater height than 50 feet. The Bill provided for the anticipated needs of the next 18 years; and therefore the proposed expenditure would not be all at once incurred. The present water supply was an excellent one as to quality; and the water now proposed to be taken was admittedly good. There was only one opponent to the measure—Sir H. D. Ingleby, of Ripley Castle—and the complaint of this gentleman was that his Haverah Park Estate, of 3600 acres, would suffer from the closing of Scargill Beck. To meet this complaint, it was proposed to allow compensation water to the extent of 125,000 gallons daily during the summer season—or some three or four times more than the dry-weather flow of the stream. During the winter months, compensation water would not be required. This offer was surely all that could be desired. The Company were willing to afford a supply to some houses on the estate, and to put up cattle-troughs to a reasonable number and extent. They could not supply sufficient water to irrigate the land; but they were willing to do all that was usual in such cases. The County Council of the West Riding, who were in the position of guardians of the streams and rivers into which they flowed, were satisfied with the Bill. He urged the Committee to pass the preamble.

Mr. *E. W. Dixon*, Engineer, examined by Mr. LLOYD, said that the population of Harrogate was a rapidly growing one; and the question of a further supply of water was a matter that must be faced in the immediate future. In the present Bill, powers were sought to construct further works for the purpose of attaining the necessary increased supply. The watershed now to be taken extended over about 1700 acres; and this would be added to the 1000 acres already acquired. With respect to Sir H. D. Ingleby's petition, an agreement had been come to with the County Council for sufficient compensation water to be given. If this agreement was not satisfactory to Sir H. D. Ingleby, probably the Company would be prepared to give a domestic supply to the houses on his estate, and also to furnish water for a reasonable number of cattle-troughs on the estate; and this, he thought, would be a supply which would afford ample accommodation.

Cross-examined by Mr. FREEMAN, witness stated that the Company were willing to allow compensation water to the amount of 125,000 gallons a day to Sir H. D. Ingleby; and this, he considered, constituted a fair and liberal compensation for the land disturbed. The quantity of compensation water to be given was not below the average.

Mr. *E. K. Burstal*, M.Inst.C.E., said he had made himself acquainted with Harrogate and its neighbourhood, and also with the works of the Water Company; and he was familiar with the circumstances which had necessitated the present application to Parliament. He concurred in the opinion expressed by the last witness, that the time had come when a further supply of water was necessary to meet the demands of a rapidly growing population.

The CHAIRMAN: That, I think, is not disputed at all?

Mr. LLOYD: I think not.

Witness (continuing) said he was acquainted with the proposal made in the clause as agreed with the County Council for compensation water. He had read Sir H. D. Ingleby's petition; and he had come to the conclusion that the compensation water provided for would afford a fair and liberal supply, especially as there were no mills requiring water. He thought that the daily flow offered to be given would be about four times as great as the present flow, and that all the farms affected would have an adequate supply. He regarded the offer as a just one.

Mr. *Thomas Fenwick*, M.Inst.C.E., said he agreed with all the last witness had set forth. He himself was conversant with the circumstances of the case, and was familiar with the district affected, and with the works at present existing. He was acquainted with the details of the proposed works, and also of the clause agreed to with the County Council providing for compensation water amounting to 125,000 gallons a day. He had inspected Sir H. D. Ingleby's estate; and he thought that, under all the circumstances, the quantity of compensation water proposed to be given would be a quite sufficient supply. There were, in his opinion, no engineering difficulties in the way of carrying out the scheme; but he was inclined to think that a money compensation would be the best way to settle the claim of Sir H. D. Ingleby.

Mr. LLOYD said that completed the case for the Bill.

Mr. FREEMAN said he would trouble the Committee with two points only. The first was in respect of the inadequacy of the compensation water which it was proposed to send down—namely 125,000 gallons per day. This amount was inadequate, and disproportionately small in comparison with the quantity usually given under similar circumstances. The second point he desired to urge was that they were very desirous to have water paid out along the line of the catchwater, so as to come to the fields, instead of pecuniary compensation.

Mr. *Woodhead*, Engineer, stated that he had made himself acquainted with the Haverah Estate and the proposal of the Harrogate Water-Works Company. In regard to the 125,000 gallons compensation water, it was proposed to send down only 85,000 gallons pending the raising of the water in the reservoir to its full height. Such compensation was not sufficient, but should be increased to about 700,000 gallons a day. He had made his calculation on the basis of the rainfall in the years from 1865 to 1895. It would be more conducive to the interest of the owner of the estate to obtain compensation in water than in money.

Mr. *J. H. Hanson*, Engineer, gave corroborative evidence.

Mr. *Needham*, land agent to Sir H. D. Ingleby, gave evidence in support of the petition.

Counsel having addressed the Committee,

The CHAIRMAN said the Committee considered the preamble of the Bill to be proved. With reference, however, to the compensation water, they held that 200,000 gallons per day would be a fair amount to be given. They were also of opinion that the water to be furnished to the farmhouses and to the farms, should be supplied in a way satisfactory to Sir H. D. Ingleby or his representatives. In reference to the matter of the clause, dealing with the measurement of the compensation water, they thought that it should be similar to that inserted in the Clydebank Water Bill, and that it should be such as would enable Sir H. D. Ingleby or his representatives to satisfy themselves that the agreed quantity was really being sent down the stream; and for this purpose, every facility should be given. The clause dealing with the level of supply must also be so altered as to arrange for a supply of water whatever the level.

Tuesday, July 13.

HARROGATE CORPORATION (WATER TRANSFER) BILL.

This Bill, which is to authorize the Corporation of Harrogate to purchase the undertaking of the Harrogate Water Company, and to supply water within the borough and adjacent districts, was considered by the Committee to-day. The proceedings in the Upper House, in which the Bill originated, were reported in the "JOURNAL" on March 30 (p. 715).

Mr. BALFOUR BROWNE, Q.C., Mr. WORSLEY TAYLOR, and Mr. M'KENZIE appeared for the promoters; Mr. PEMBER, Q.C., and Mr. LLOYD for the Water Company, who opposed the Bill.

Mr. WORSLEY TAYLOR, in opening the case for the promoters, said that the prosperity of Harrogate dated from about 200 years back, when the medicinal water was discovered. Since then improved railway communication had been effected, and other improvements made. There had been a considerable increase in population; and the town had advanced in many directions. In 1861, the population was 4200; and now it was 18,500 odd. Besides this, there was, of course, a large visiting population of from 8000 to 10,000 at a time. The rateable value had risen from £17,041 in 1861, to £118,000 at the present time. The Corporation owned the water used for medicinal purposes; and they considered the time had come when they should own the supply for domestic and sanitary purposes. This could be done, he contended, with advantage to the community and without disadvantage to the existing Company, providing that the undertaking was handed over on fair terms. There was no doubt, in his opinion, that Harrogate would continue to grow; and having regard to the character of the place, no one could dispute for a moment that the water supply was of the utmost importance. The fact of the supply being in the hands of the Local Authority, would also give increased confidence to the visitors to Harrogate. The Water Company had now practically come to the end of their resources; and they could not go on without coming to Parliament for additional powers. The Company, to all intents and purposes, were seeking to create a new undertaking at a total cost of £90,000; and he considered the time was most opportune for the Corporation to step in and purchase the concern—especially when the Town Council, the ratepayers, and the medical profession were unanimously of opinion that the transfer should take place. Beyond this, the local authorities outside Harrogate were also anxious the Corporation should have control of the supply. Dealing with the petition against the Bill, Counsel said the Company considered that they would not be able to obtain compensation, on the ground that the purchase was compulsory. But there was nothing in the Arbitration Act to justify this view.

Mr. *J. H. Wilson*, J.P., Mayor of Harrogate, supported the statement of Counsel. Speaking as a professional man, he looked upon Harrogate as one of the leading inland watering-places in Great Britain. The eight capital springs—sulphurous, iron, and otherwise—formed one of the widest ranges of medicinal waters in Europe. As regarded the present Bill, the Corporation were absolutely unanimous in favour of the transfer; and a public meeting called on the subject was certainly the most unanimous he had ever seen or heard of in Harrogate. At the last November elections, candidates for municipal honours who supported the purchase were received with universal approbation. The medical faculty had expressed practically a unanimous opinion in favour of the scheme. He also had given a great deal of thought to the subject; and he considered that inland watering-places—and still more health resorts depending largely upon invalids—should have the control of the water supply in their own hands. The desire of the Corporation was to deal fairly and liberally with the Water Company. He defended the purchase of the undertaking on broad public grounds; and he did not desire to enter into any question of friction which had arisen between the Corporation and the Company, though there had been some small points of difference from time to time.

Mr. LLOYD: We are quite willing to take up the matter of friction, if thought desirable.

In cross-examination by Mr. LLOYD, witness said the ratepayers had been told at public meetings that it would be a saving to them if the transfer took place. He was not prepared to enter into details as to how this would come about. He considered the present time was opportune for the purchase of the undertaking, because the Company were getting to the end of their powers. It was true the rates of Harrogate had been going up, and that the Town Clerk, in presenting the estimates this year, said: "I have never presented an estimate with less confidence than I do this year." Perhaps that was a wise remark; but he (witness) certainly did not agree with it.

Mr. *W. H. Wyles*, Town Clerk of Harrogate, gave corroborative evidence. He added that the population of Harrogate and of the area twenty miles round could not, he believed, be less than a million. At the rate at which he could borrow for the Corporation, he could take over the water-works, less the cost of compensation, by a loan which would cost the ratepayers a little over £3000 a year in interest for a term of fifty years. The Company in getting a loan would have to pay higher interest; and consequently the consumers would have to pay more for the water. In other words, the ratepayers would be more heavily taxed.

Mr. LLOYD (in cross-examination): When the last estimate was presented by you to the Council, did you say you never in your life produced an estimate with less confidence?

Witness: Yes; I said that. But it is very easy of explanation. In making the estimates for the Local Authority for the past twenty years or more, I have been able, with the assistance of the Finance Committee, to make the estimates and the actual outlay come so close that we have never had to levy a supplementary rate. But there are two new items of expenditure of a character on which I have no data; and this accounts for the words I used. The bringing in of the electric light, and the

building of the new baths, which cost £100,000, were new items; and no good financier could speak with confidence as to the future of these establishments until after they had been tested. It is a fact that the Corporation have got a great many irons in the fire, and that they are also considering the improvement of their drainage system.

Mr. *Charles Gott*, M.Inst.C.E., of Bradford, examined by Mr. M'KENZIE, said, in regard to Harrogate, there were reasons why he thought the control of the water supply should be in the hands of the Corporation. There were natural reasons, arising from the situation of the town and the contiguity of sources of supply to the town itself. The advantages in this respect were there; and they naturally belonged to the inhabitants of the district. Then, owing to the high level of the source of supply, the water could be furnished entirely by a process of gravitation. No pumping works were required; and this, of course, was another advantage. Where schemes of water-works were based upon a system of gravitation, no large storage works need be constructed in the case of a corporation, because they could use the surplus water. On the other hand, with a company it was difficult for them to make any use of the surplus water, and it was entirely lost. In a place such as Harrogate, it was of exceptional importance that the Local Authority should have control, because the water could be used with the view to promoting the convenience, health, and comfort of the town. As to borrowing, the Corporation could undoubtedly borrow with greater advantage, and at a lower rate of interest, than a private Company.

Cross-examined by Mr. LLOYD: He knew of instances where water-works had been compulsorily purchased. It had been done under the Lands Clauses Act. He did not think that by putting in the clause that the purchase should be made under the Arbitration Act, instead of under the Lands Clauses Act, the Corporation desired to get rid of their responsibility to compensate. He did not think it made any difference which Act the works were acquired under.

Mr. LLOYD was further cross-examining witness with the view to showing that the Company supplied water on reasonable terms, when

Mr. M'KENZIE observed that there was no dispute as to the charges made. Moreover, he was willing to substitute the Lands Clauses Act for the Arbitration Act, if it was thought no compensation would be forthcoming under the latter Act.

This course was agreed to; and the Committee proceeded to take the evidence of

Mr. *James Mansergh*, M.Inst.C.E. He said nearly all the great towns in England had the water supply in their own hands. In Harrogate, he thought the supply ought to be under the control of the Local Authority. He did not see that there was anything to injure the Company if the transfer was made. He thought, too, that the transfer ought to take place under the Act which gave the most favourable terms of purchase to the Company. The Corporation, he was sure, would desire to have a fair valuation, so that the shareholders should not be prejudiced in the slightest degree. Inasmuch as the Company now had to ask for additional capital, he thought this was a most opportune time for the transfer.

Mr. LLOYD (in cross-examination) asked if witness believed the Company had come to the end of their tether.

The CHAIRMAN: They practically admit that, when they come to Parliament for an Act to extend their works.

Mr. LLOYD replied that this was in order that they might provide for contingencies in the future.

Mr. *Gainsford*, Chairman of the Water Committee of the Sheffield Town Council, said he was familiar with the advantages of municipal ownership of water undertakings, as proposed by the Bill. He thought, from his experience, that there was much more general satisfaction when it was known that such a prime necessity of life as water was in the hands of the local authority, than when it was the subject of private trade. This was a general principle. But besides this, he felt that water-works were more economically managed by a corporation than by a private company. If they came to the case of Harrogate particularly, he agreed with the evidence given by other witnesses, that there were special reasons why the time was opportune for the introduction of the Bill. In his opinion, considerable advantages would accrue to the Corporation of Harrogate if the transfer took place.

That closed the case for the promoters.

Mr. LLOYD, without addressing the Committee, then proceeded to call evidence.

Mr. *E. K. Burstal*, M.Inst.C.E., said he had made out a table showing the comparative charges under the Corporation Bill and under the Bill of the Company which was passed the previous day. The rateable value of the majority of the houses in Harrogate would be under £60 a year; and the charges for water to these houses would be greater under the Corporation Bill than under that of the Company. In respect of a house of the annual value of £10, under the Company's Bill the rate charged would be 20s., and under that of the Corporation the rate would be 26s. For houses of £15 value, the rate under the Company's Bill would be 26s. 6d., and under the Corporation Bill 24s.

The CHAIRMAN: Therefore the advantage to the consumer is under the Corporation Bill?

Witness: Yes; but in regard to houses of £20 the charges were identical, and from £25 to £60 the balance was entirely in favour of the Company. Witness added that he had also considered the question from a financial point of view. The share capital of the Company could be raised at 3⅜ per cent. by the auction clauses, and the loan capital at 3 per cent., which would give an average of about 3¼ per cent. He did not know of a single case of compulsory sale where no allegations had been made against the company concerned.

Mr. *Thomas Fenwick*, M.Inst C.E., said he did not agree with the witnesses for the Corporation, that this was a just and proper time for the transfer of the undertaking; and he saw no good reason for the Company having their works taken from them, when they had done their duty most consistently for half a century, and had done everything the Corporation could do if they had the undertaking. The Company were in a position to raise money at a very reasonable rate. He knew of no case where Parliament had authorized a compulsory transfer when there had been no complaint.

Mr. LLOYD said he had a body of evidence to the same effect which he could call. He, however, would not further trouble the Committee with witnesses, but would address them briefly on behalf of the Company. The Company had been a statutory one since 1846; and not one word had been said against them. The Company had existed under abnormal circumstances, which ought to be taken into consideration by the Committee. The other side had laid stress on the great increase in the population within a short period; but, in spite of this, the Company had coped with all the difficulties so well that Harrogate had never had one hour's short supply, and therefore the Company were entitled to the gratitude of Harrogate for services they had so efficiently rendered.

Mr. WORSLEY TAYLOR, replying on behalf of the promoters, said the real point the Committee had to consider was whether there was any hardship inflicted on the Company by the proposed transfer. If not, and the municipality considered that in the interests of the community they should have the supply in their hands, then it was the duty of the Corporation to seek powers to enable them to purchase the undertaking.

The Committee, after briefly consulting in private, announced that they considered the preamble of the Bill proved.

HOUSE OF LORDS COMMITTEE.

Tuesday, July 6.

(*Before Lord* WELBY, *Chairman, the Earl of* LEVEN *and* MELVILLE, *the Duke of* ATHOL, *Lord* WINDSOR, *and Lord* GRANARD.)

NEWARK CORPORATION WATER BILL.

This Bill, which was promoted by the Corporation of Newark to define an area in which they might pump water for the supply of their district, to the exclusion of any and all other corporations, authorities, or companies, came before the above-named Committee to-day.

Mr. BALFOUR BROWNE, Q.C., and Mr. H. LLOYD appeared for the promoters; Mr. READER HARRIS represented Mr. L. R. Starkey, Mr. W. Hexley, Mr. Milward, and Mrs. E. A. Crawford, landowners within the limits of supply of the Corporation, petitioners against the Bill.

Mr. BALFOUR BROWNE, in opening the case, explained that prior to 1891 Newark was supplied with water from the River Trent, but in that year it became unfit for domestic purposes, and a Bill was promoted under which the Corporation were allowed to purchase the water-works, and construct a pumping-station at Farnsfield, with certain reservoirs, and a line of pipes which conveyed the water to Newark. The source of the water was the pebble beds. The scheme proved entirely successful; and an excellent supply of good water was obtained. The increasing demands of manufactories, as well as the growth of the population, necessitated the Corporation taking steps to protect their source of supply. Upon their works they had spent £100,000, which was a heavy amount for a small community, the population of which was only between 16,000 and 17,000. Unfortunately, the pebble beds yielded such excellent water that they had been resorted to by a large number of other authorities. First of all Mansfield had a pumping-station to the north; while Sutton-in-Ashfield had a pump and well close to those of the Newark Corporation. Then at Blidworth there was a well, and also a pumping-station, belonging to another local authority. At Papplewick, a pumping-station was erected by the Corporation of Nottingham, who had wells at Bestwood and Basford. The Corporation promoted a Bill to enable them to sink wells at Oxton, Woodborough, and Boughton; but this was seriously opposed, on the ground that it would over-pump the watershed. It was proved before a Committee of the other House that a great part of the Dover Beck was, in consequence of this over-pumping, now dry; and the Bill of the Nottingham Corporation had been refused, so far as Oxton and Woodborough were concerned.* The present Bill asked for a four-mile limit, in which no authority other than the Corporation of Newark could sink a well. Counsel argued that it was absolutely necessary for the Corporation to have some sort of protection for their water supply; and they now applied that the limit of the well-sinking should be coterminous with the area of their compulsory supply. The petition presented against the Bill was signed by four persons; but it would be seen from the Bill that the rights to water and other landlords' rights were amply protected, so far as pumping water which they could use for themselves or sell to tenants and dependents was concerned.

Mr. *H. Rofe*, M.Inst.C.E., was then examined in support of the Bill. He described the physical features of the district, and the watershed of the Dover Beck, and stated that, in consequence of the excessive pumping, the well at Farnsfield was now 102 feet down. The Newark Corporation had acquired 15 acres of land round the present pumping-station, with the view of erecting a second pump to raise 2 million gallons of water per day. The average rainfall of the district was 23 inches on the mean rate of the three driest years. If the underground water were exhausted, they would have to depend on the rainfall for a supply. In his opinion, the district was too heavily pumped; and the effect had been to lower the level of the wells 28 or 30 feet within the past few years. If more water were pumped than the rainfall, the store would be entirely exhausted. He considered it was most essential that Newark should protect its source of supply.

In cross-examination by Mr. READER HARRIS, witness said that the opponents of the Bill had some small farms, and it was quite possible that any person might buy from them half an acre of land and erect a pumping station; and then, in order to protect their supply, Newark would have to compensate them or buy them up. He could not give any precedent for the protection which the Corporation sought; but, precedent or no precedent, they wanted the protection. If any party came into the district and sank a well 50 feet deeper than the Newark well, this meant that the well would be depleted and dried, and they would have to go 50 feet deeper than the intruders. A four-mile protection area would give Newark two miles of protection. They did not wish to stand in the way of landlords pumping water for their tenants, but to prevent the water being taken away from the district. He acknowledged that the Newark Corporation were drawing water from under the other landlords' property, and did not propose to pay anything for it in the way of compensation. There was no idea of a protected area in 1891. They could have gone to the landlords, as Nottingham did at Boughton, and made agreements with them; but they did not. Others might come after them and buy land; and as there were no rights in underground water, they could not be prevented from sinking wells.

* The proceedings before the Commons Committee will be found in the "JOURNAL," Vol. LXIX., pp. 993, 1064, 1195.

Mr. *J. Mansergh*, M.Inst.C.E., cited instances of protection similar to that asked for by the Corporation, and granted on somewhat different lines. He held the opinion that landlords had no rights in underground water; and in these circumstances he thought it was not feasible to pay compensation. Hundreds of persons might acquire half an acre of land each, put down a pump, and then ask to be compensated. The petitioners were there simply to get money as compensation.

Mr. READER HARRIS: What we want is to have this clause struck out of the Bill, so that we may enjoy our rights to the water.

Witness: Oh, nonsense; you have no rights in the water.

And especially seeing that you have no need of any more water than you now have?—At the present moment, no. We have plenty of water at present; but we want protection, so that we may be able to retain the supply, on a principle which Parliament has already sanctioned.

Professor *Boyd Dawkins*, F.R.S., spoke to the necessity of the water supply being protected, and said that, though the Newark Corporation could duplicate and reduplicate their pumping machinery, and increase their supply, the pumping had a limit controlled by the rainfall.

Answering Mr. READER HARRIS, witness said he thought the position of the Newark Corporation in reference to the protection sought was quite different from that of Nottingham with respect to Boughton. Nottingham had gone far out of its district.

Mr. LLOYD: But Newark has its water, whereas Nottingham wanted to purchase a fresh supply?

Witness: Certainly; that is so, and it makes all the difference.

Newark is at home asking to retain what Parliament has given them; while Nottingham has gone into a strange land for a fresh supply. The cases are essentially different?—Certainly.

Mr. LLOYD: I put it that no landlords opposed us in the House of Commons; and Counsel can only find four to oppose us here. That is my case.

Mr. *W. H. Radford*, Assoc.M.Inst.C.E., was then called on behalf of the opposing petitioners. He said the purpose of the Bill was that no one should sink a well for the sale and supply of water to his estates within the limits of the restricted district. Even if the Bill were passed, there was nothing to prevent an outside authority from sinking a well within a mile of the Farnsfield pumping-station, and supplying water to other authorities. Newark had originally asked for protection against the wells at Woodborough and Oxton, and they had succeeded; but they were now seeking protection against all future comers. In the case of Nottingham, the Corporation had paid £470 a year for protection against others sinking wells on the land they had bought; and Newark was asking for this protection for nothing. He thought that protection was not wanted; because before an authority could come into the Newark water area, they would have to apply to the Local Government Board; and then objections could be stated at the usual preliminary inquiry. He had not heard of any case in which a landlord's rights in underground water had been interfered with without compensation. If the Bill were passed, no local authority could acquire land and erect a pumping-station in the protected area for the supply of water in their district. If protection were granted, it should be limited to two miles of Farnsfield, in the direction of Newark; and landlords should be allowed compensation. There was no reason why what had been done by Nottingham at Boughton should not be done by Newark. The size of Farnsfield was its own protection. No sane man would think of sinking a well near one of the large existing wells. The present proposal would not be effective; and if it was, it would be unjust to landlords and to the bodies outside the protected area.

Wednesday, July 7.

On the resumption of the proceedings this morning,

Mr. *W. L. Huskinson* said he was agent for Mr. Wilson's estate of 1800 acres, which was immediately adjacent to the Farnsfield pumping-station. Though the most valuable part of the estate was to the north of the promoters' well, it really lay all round the well; the water rights of the estate—the River Greet—rising on the estate. Within the past two years he had had transactions with local authorities as to the sale of water and preferential claims for water. The landlords round Farnsfield had made agreements with the Nottingham Corporation as to the purchase of water; and he saw no difficulty in making similar agreements between a dozen landlords and the Newark Corporation. In the case of the Woodborough pumping-station, he had concluded agreements with the Nottingham Corporation, on Sir Charles Seeley's behalf, for the payment of a retaining fee for the exclusive right to the water there. Farnsfield was such a large pumping-station that no authority would think of putting down another well close by. On behalf of Mr. Wilson, he thought the proposal of the Newark Corporation improper, unprecedented, and unjust. His opinion was that this matter should be settled by agreement.

Cross-examined by Mr. LLOYD, witness said the number of pumping-stations had depleted the water, and any addition to them would add to the evil. In the case of Nottingham, that was a Corporation coming for the first time into the district for water. Newark did the same thing in 1891; but they bought the land, and then exercised their rights of pumping without offering compensation, whereas Nottingham offered compensation. Newark was doing in two stages what Nottingham did in one. The most distant part of Mr. Wilson's estate was less than two miles from Farnsfield. Part of Mr. Starkey's property was within the two-mile radius, and part beyond. All Mr. Wilson's property was within Farnsfield parish.

Mr. LLOYD: Then what you want to do is to be able to pump such water as you find, and sell it to other authorities?

Witness: We want to preserve what rights we have.

Is not what you desire to retain the right to sell water from under your land to people at a distance?—Yes, to the world at large. That is a right on every estate, and we want to retain it or else to be paid compensation.

Mr. *Radford*, who had given evidence on the preceding day, was re-called, and cross-examined by Mr. LLOYD. He said the district was over-pumped. All the wells had gradually been lowered, as they were drawing from the same source of supply; and the surface of the land had become desiccated.

Counsel asked a number of questions as to witness's construction of clause 6 of the Bill.

The CHAIRMAN asked what Mr. Lloyd's own construction of it was.

Mr. LLOYD replied that, when Newark had their district of supply defined, they had put upon them the obligation to supply Southwell; but if Southwell chose to supply itself, it was to have the right to purchase what pipes were necessary for the purpose, except such as were used for Newark alone. The price of thee pipes was to be settled by arbitration. Section 21 of the Bill protected this privilege, and gave the right of obtaining a supply, which he thought included the sinking of a well for themselves, if necessary.

Witness: Southwell might purchase the subsidiary pipes; but they could not purchase the main pipe through which the water pumped passes to Newark. They might have a right to sink a well; but they could not supply outside the Newark protected district. They could only supply the part of their district which was within the Newark district.

All this is very interesting to the local authorities; but how does it affect the landlords who are opposing here?—The landlords could sell the water only for the supply of such area as was within the district.

If these rights are valuable, can you form any estimate of what it would cost in respect of 27,000 acres to obtain an apportionment of compensation?—I cannot. I should think if the Newark Corporation were to give notice under the Land Clauses Act they would only do it close to Farnsfield well.

Who is to settle where the Corporation of Newark are to stop?—The protective area should extend to such land respecting which the Corporation gave notice within the three-mile limit.

Then you leave it to the Corporation to say in respect of what land they gave notice?—Yes; because they are the best judges of what would be valuable to them.

Mr. READER HARRIS, in replying for the opposition, addressed himself first to the injury that would be wrought to the landowners should the Bill become law; and what these would suffer would, he said, affect a large number of others. The motive which had induced the petitioners to go to the expense of appearing against the Bill had been not only their own individual injury, but the general principle contained in this extraordinary application, which was admittedly made because Nottingham was proposing to sink wells at Oxton and Woodborough. It was well known that the underground water in this area flowed from north-west or west to east; and the Newark Corporation felt that any pumping-station at Oxton or Woodborough would seriously affect their Farnsfield pumping-station. They therefore wisely deposited, in their own interest, a Bill to protect themselves from any injury they might receive from the pumping at those places. The House of Commons Committee thought it wise to strike out of the Bill of the Nottingham Corporation any powers to make pumping-stations at Oxton or Woodborough; and thus they took away any fear of the Corporation coming within the sphere of the Farnsfield station. All he had to do with in the present Bill was the remarkable proposal to give a protective area—not such as Nottingham had asked for, and obtained by agreement, of two miles, but one of the irregular and extraordinary districts over which they supplied water. He had not thought it worth while to deal with all the area, because the real question at issue was the protective zone round the Farnsfield well. He urged that the proposal of the Bill was without precedent, was unnecessary, ineffectual, improper, and unjust. Instead of leading to peace, it would give rise to legal proceedings and endless lawsuits all over the country. To create a precedent, their Lordships must be satisfied of the absolute need of protection, the propriety of the method proposed, and the justice of the course suggested. The Local Government Board had called attention to the fact that the scheme was unprecedented, and suggested that there must be strong legal evidence of the need of protection before a precedent of this sort was created. There was not a tittle of evidence to show that this protection was needed, because Newark had an ample supply of water at present and for years to come. If the Corporation desired a protected area, they could obtain one by agreement with the landlords, who, he held, were precluded from selling water for trade purposes while the Corporation were entitled to do so. Again, it was proposed to attach the water rights of 27,000 acres without giving one penny of compensation. Compared with the conduct of Nottingham, this proposal was most arbitrary. It was said that the petitioners were only four small landowners. But there were only four landowners at Boughton; and the question of small or great did not arise when the principle of compensation was involved. At Boughton, Nottingham had obtained protection; and Newark could do the same thing at Farnsfield by the adoption of similar means.

Mr. LLOYD, in reply, pointed out that the only place interested in the refusal of protection was Southwell; and that was amply provided for by the Act of 1891. The district was being depleted of water until the surface had become desiccated; and it was in the interests of the landlords as well as of everybody else that protection should be granted. There was nothing to prevent Nottingham agreeing with the landowners even in the district of the Newark supply, for the purchase of land for pumping purposes. This might go on indefinitely; and each time Newark would be put to the cost of defending itself. All the complaint of these landowners was that they might be deprived of a possible customer for their water; and this possible customer was Southwell, who could, if it chose, supply its entire district by the purchase of the distribution service of the Newark Corporation. All that Newark had done was to endeavour to protect itself, and at the same time secure to the landlords the use of the water on their estates, and to Southwell the right to sink wells and supply its own district.

The CHAIRMAN said the Committee had decided that clause 21, which defined the protected area, and so much of the preamble as related thereto, should be struck out of the Bill.

The Cuckfield District Council and the Mid-Sussex Water-Works.—The Cuckfield District Council last Wednesday passed a resolution to acquire the undertaking of the Mid-Sussex Water Company. The Council applied to the Local Government Board to sanction the purchase some time ago; and a public inquiry was held, after which the scheme was sanctioned. The Council, however, in deference to the professional opinion of Mr. Mansergh, did not proceed. Last Wednesday he and Mr. Davy, a Local Government Board Inspector, were present at the deliberations of the Council; and the outcome was a decision to push the matter forward as quickly as possible.

LEGAL INTELLIGENCE.

COLCHESTER COUNTY COURT.—Tuesday, June 13.

(*Before Deputy-Judge* FITZROY COWPER.)

Action for Damages for Failing to Furnish a Sufficient Supply of Water.

In this case, Louisa Macnab, of the Bedford Hotel, Clacton-on-Sea, sued the Clacton-on-Sea Gas and Water Company, Limited, to recover £50 damages alleged to have been sustained by failure of the latter to give a sufficient supply of water between July 8 and July 17 last year.

Mr. STEPHEN LYNCH appeared for the plaintiff; and Mr. C. F. PRITCHARD for the defendants.

Mr. LYNCH, in opening, stated that plaintiff kept a private hotel at Clacton. In June last year, when the hotel was full of visitors, and the weather was very hot, there was, for a considerable time, no water supplied to the premises; and, though he knew the defendants could not be made responsible for the occurrence, a kitchen boiler burst owing to the servant expecting that the water would come in as usual, and lighting the fire. There was no water in the house to drink; and there were complaints from the Sanitary Authority. From July 8 to July 17 not a drop of water came into the house; and all they could get was from a pump on a neighbour's premises. Other places in Clacton were similarly treated.

Plaintiff stated that she complained of the condition of things two or three times a day to the collector. Owing to the absence of water, the stench in the house became abominable; and her guests diminished from fifty to fifteen.

In cross-examination, witness admitted that the water-rate for the time in question had not been paid in advance. Her tanks would only hold about 380 gallons; but they ought to be filled by the Company four times a day.

His HONOUR asked Mr. Pritchard whether he suggested that the water did come in.

Mr. PRITCHARD replied that he certainly did. At the time in question, a great deal of water was used; and the tanks at the hotel were totally inadequate for a place of the size. The water was turned on; and it came into the adjoining houses. One of the Company's defences was that at the time there had been a very unusual drought; and the Company unquestionably were short of water. For that reason they did not turn the water on for so long as they usually did.

Other witnesses having been called,

Mr. PRITCHARD submitted that there was no case; basing his contention on a section of the Water-Works Clauses Act providing that owners and occupiers should be entitled to a sufficient supply if they had paid or tendered the water-rate in advance. In this case the rate had not been so paid.

Mr. LYNCH contended that this was a statutory defence which must be pleaded.

Mr. PRITCHARD urged that the case had not been made out.

Mr. LYNCH admitted that he had no case under section 43 of the Water-Works Clauses Act, which provided the penalty which was to be forfeited; but he contended that this section was overruled by section 28 of the Clacton Gas and Water Works Order.

His HONOUR supported Mr. Pritchard's view, holding that clause 43 of the Water-Works Clauses Act applied to the case, and that section 28 of the Clacton Order did not intend any contract between the Company and the persons supplied. There was therefore no cause of action; and he non-suited the plaintiff, with costs.

The "Patent Gas Regulator" Case at Portsea.

At the Portsmouth Quarter Sessions last Friday, Henry Orley, the landlord of the "Ship and Castle," Portsea, surrendered to his bail to answer an indictment for stealing 13,000 cubic feet of gas, valued at £1 10s. 4d., the property of the Portsea Island Gas Company, between March 1 and 28. The Police Court proceedings were noticed in the "JOURNAL" for May 18 (p. 1144). Mr. Temple Cooke now appeared for the prosecutors; and prisoner was defended by Mr. Mathews and Mr. Emanuel. It may be remembered that, in the cellar of defendant's premises, there were two meters—one for the supply of gas to the bar and the private part of the house, and the other for the supply to two cooking-stoves in the restaurant. On March 27 an Inspector of the Company examined the meters. He found the second one covered with a sack; and on removing the latter, he discovered the inlet and outlet pipes had been detached. The ends of the pipes were connected by india-rubber tubing, so that gas passed from the main without being registered. Taking the average for previous quarters, it was estimated that some 13,000 cubic feet had been stolen in this manner. One of the Company's officials deposed that when he called to see the meter, the prisoner asked if the arrangement which had been fixed was not a governor, and asserted that it had been put on by a man calling himself George Loughley, who said that it was a "patent gas-regulator." Evidence was also given by a police sergeant who had made inquiries in Portsmouth and Southampton; but he could not find that rubber piping such as was used for making the connection was stocked in any of the shops. He discovered, however, that it was kept in store in the dockyard; and the "Ship and Castle" was just outside the dockyard gates. He stated that he had also made inquiries about the man described as Loughley, and found that such a person had been selling gas-burners, but could not find he had been offering to affix "gas-regulators." Orley had made an application for a warrant for the arrest of Loughley; but the Bench refused to grant it. Defendant had been a licensed victualler for five years with an excellent character. Prior to that he served for some 28 years in the Navy. For the defence, evidence was given to show that the man Loughley had repaired a beer-engine for the prisoner, and afterwards went into the cellar, and without the defendant's consent (he being absent at the time) affixed what he described as "a patent gas-regulator" to the meter. Prisoner, it was urged, had no knowledge of the actual nature of the contrivance. The jury found the prisoner guilty; and next morning he was sentenced to two months' hard labour. In consequence of this conviction, Orley loses a pension of £52 a year.

The Consumption of Gas by Incandescent Burners.

A novel and interesting point was raised in an action which came before his Honour Judge Edge, in the Exeter County Court last Wednesday. The plaintiffs were the Urban District Council of St. Thomas, a suburb of Exeter; and the action was to recover £16 14s. 7d. from Hubber and Son, plumbers and gas-fitters of the city, for breach of warranty. It appeared that the Council, the latter part of 1895, decided to light the main streets of St. Thomas with incandescent gas-burners; and they advertised for tenders for supplying and fixing them in 23 lamps. The advertisement specified that the burners should not consume more than 3½ cubic feet of gas per hour. Defendants' tender to supply 23 "C" pattern burners for £40 10s. was accepted; and the number was increased to 28. The burners were fixed; but it was afterwards found that they were consuming 6 cubic feet of gas per hour, and from Feb. 1 to June 30, 1896, the Gas Company charged the Council £13 extra for additional gas. The Council had also to incur an expenditure of £3 14s. 7d. in attaching regulators to the burners, to reduce the consumption to 4 cubic feet per hour. For the defence, it was contended that the contract was to supply a burner which would consume 3½ cubic feet of gas per hour at a pressure of 10-10ths of an inch, and that the plaintiffs ought to have stated that the pressure at St. Thomas's was 20-10ths. It was also urged that there was mismanagement and negligence on the part of the staff of the Council in employing a labourer instead of a competent man to look after the burners. Mr. F. Hubber, one of the defendants, said that after the burners were fixed he went to St. Thomas's about a dozen times and was satisfied with the manner in which they were going on. The subsequent appearance of the mantles showed that the burners had been improperly treated in cleaning. His firm offered to look after the burners, and gave the Surveyor to the Council an estimate of what they would do it for. He considered the pressure in Exeter was 15-10ths, and always thought that it was the same at St. Thomas's until he heard differently that day. His Honour held that the contract was to supply and fix burners in such a manner that they would consume only 3½ cubic feet of gas per hour; and that it had not been completed. The judgment must therefore be for the plaintiffs. With regard to damages, he did not think the Council were entitled to their claim in full; but he would allow them 10 guineas and costs.

Stratton and Bude Water Supply.—At a meeting of the Stratton Rural District Council last Tuesday, the Clerk reported that the question of the water supply of the towns of Stratton and Bude was at length settled. Agreements with the landlords and tenants affected by the carrying out of the Wrasford Moor scheme were in progress, and would be shortly executed. Notice was given of a resolution to apply for powers to borrow £7370 to carry out the scheme.

European Gas Company, Limited.—The annual meeting of this Company was held yesterday; and a report of the proceedings will be given in our next issue. In the meantime, it may be stated that the consumption of gas during the year showed, taking the stations together, an increase of rather more than 2 per cent.—the greatest advance having been at Havre. This increase was attributed entirely to the extension of business among small consumers, who are given every possible facility for taking gas under various systems of having fittings on hire, among which prepayment meters meet with special favour. The number of consumers was augmented by 5720. The profit was £84,334, which is an advance of £1774. After paying the usual dividend and a special bonus of 1 per cent. on all shares according to the amount paid thereon, a balance of £1654 remains to be carried forward to the reserve of undivided profits. The report and accounts were adopted, on the motion of the Chairman (Mr. J. Blacket Gill).

The Management of the Wells-next-the-Sea (Norfolk) Gas-Works.—A special meeting of the Urban District Council of Wells-next-the-Sea was held on Monday last week, for the purpose of discussing a report of the Gas Committee, in which it was strongly urged that the Council should consider the necessity of engaging a thoroughly competent working manager to take the responsibility of the gas supply, furnish a monthly report to the Council, and work with the present foreman. When the ordinary meeting of the Council was held it was resolved to follow these recommendations. Mr. A. J. Ramm then said he should like to withdraw the part of the minutes relating to the appointment of a manager, as he did not think it was at all necessary for any change to be made at present. The Chairman (Mr. G. F. Smith) said they could not alter the minutes. It was of no use to try to work the Gas Department without a properly qualified man. They were at present losing on every ton of coal carbonized. Mr. Ramm then moved that the resolution to appoint a gas manager be rescinded. Mr. Cornish seconded the motion, and it was carried. It was next resolved that the gas-works be continued as now managed for the next three months.

The Proposed Purchase of the Budleigh Salterton Gas-Works.—It is probable that nothing more will be heard of the scheme for the acquisition of the gas-works by the Budleigh Salterton District Council. In accordance with the resolution of this body, a meeting of ratepayers was called to consider the question. A small attendance evinced the lack of interest taken in the subject; and the voting showed that a decided majority of those present were in opposition to the proposal. Mr. W. Theobald, the Chairman of the Council, who presided, opened the proceedings with the declaration that he was opposed to the Council taking over the works, as he considered it would be a bad bargain for the ratepayers. Mr. Gibbs expressed the opinion that the acquisition of the works would be advantageous. He believed that the district would develop, and that, with an increase in the consumption of gas, the works would in a few years well repay the town for the initial outlay. Mr. E. Burch said the lighting of the town had for years been a bugbear to the ratepayers; and it was time that the gas-works were in their hands, in order that some improvement might be effected. Mr. Walker, on the other hand, contended that gas-works in a small place like Budleigh Salterton rarely proved very profitable. The Rev. D. Cork moved an amendment declaring it to be inexpedient for the present for the District Council to purchase the works. Mr. Meyrick seconded this; and as by this time the meeting was getting tired of the discussion, a vote was taken, with the result stated above.

MISCELLANEOUS NEWS.

THE ACCIDENT FUND OF THE SOUTH METROPOLITAN GAS COMPANY.

Abstract of the Rules.

The rules of the above fund, which, as mentioned last week, has been joined by practically the whole of the men in the employ of the South Metropolitan Gas Company, set forth that it has been established by mutual agreement between the Company and their workmen as a substitute for the Employers' Liability Act, 1880, and the Workmen's Compensation Act, 1897. It is to be used to compensate workmen for loss by reason of accident occurring to them while in service of the Company. Every accident will be admitted to the benefits of the fund, irrespective of cause, subject to certain specified limitations. The fund is to be administered by the Profit-Sharing Committee of the Company; and the accounts will be kept by the Company's officers, in the same way as those of the sick and superannuation funds, at the expense of the Company—all money being in the charge of the latter. The income will be raised by contributions from both sides. The Company will pay quarterly, on the maximum number of men (including odd hands) employed during the quarter 1s. for every man, whether or not he has joined the fund; and each man in receipt of weekly wages who accepts the proposal will pay in advance ½d. per week, 2d. a month, or 6d. a quarter, as may be most convenient. Those workmen who do not subscribe to the fund, will, in consideration of the Company's contribution thereto on their behalf, be paid therefrom what they can obtain, and no more, under the Workmen's Compensation Act, 1897, without medical attendance, and with no undertaking by the Company to find employment for them on recovery. The allowances, with free medical attendance, to members for non-fatal accidents are divided into three classes: Class A, 12s. a week for workmen whose injuries have been caused by their own gross negligence; Class B, not less than 18s. a week for pure accidents; and Class C, 24s. a week for accidents clearly caused by negligence of the Company or their officers. The class in which a man is to be placed is, in the case of doubt, to be decided under the jury system adopted by the Company in 1892, and already described in the "JOURNAL." Payment of the above-named amounts is to be continued until recovery, or until the doctor certifies that the man is fit for work, or is proved to be permanently incapacitated. In Class A, the Company do not give any undertaking as to future employment; in Class B, work will be found at not less than 24s. a week, if the wages exceeded that amount; in Class C, work will be found at not less than four-fifths of the day wages previously received, and in no case less than 24s., if the wages exceeded that amount. In cases of permanent incapacity to work, the Profit-Sharing Committee are to decide what permanent weekly allowance or lump sum shall be paid in addition to any pension from the superannuation fund to which the injured men may be entitled; but the total shall not be less than what could have been obtained under the Act of 1897. In cases of fatal accidents, the amounts due at death from the sick and superannuation funds are to be paid, and a pension granted to the widow while leading a respectable life or until re-marriage, when a sum not exceeding £10 is to be paid her. The pension is not to be less than 10s. a week; but during the first three years the Profit-Sharing Committee may grant any amount not exceeding £1 per week, which may be gradually reduced. Before any allowance can be granted for an accident, it must be proved that it occurred while the man was in the service or engaged on the business of the Company. If, in the opinion of the jury already mentioned, the accident was caused by the injured person being under the influence of intoxicating liquor, or by his gross negligence or wrongful act, the allowance is to be on the lowest scale. In case of death or permanent disablement, the Profit-Sharing Committee are to decide what allowance is to be made. The Committee are to have power to grant extras in cases where they consider these would be advantageous. The Company's system of inquiring into accidents by a jury of twelve workmen is fully explained; and a series of questions are submitted as a guide to them in making their investigations. Provision is made for altering the rules; and in all disputes as to their meaning, the decision of the Profit-Sharing Committee is to be final.

The scheme for the working of which the rates above noticed have been framed was referred to in the House of Commons last Friday towards the close, just before midnight, of the debate on the third reading of the Workmen (Compensation for Accidents) Bill. Mr. Balfour was speaking on the subject of the well-known Dudley clause, and expressing his inability to understand how certain honourable members who had voted for that clause could possibly suppose that the present Bill was a violation of a pledge given by the Government four years ago. He went on to say: The Dudley clause laid down in the most explicit terms that, while the system of arrangement was to be left to employers and employed, the arrangement which they were permitted to come to must not be pecuniarily worse for the employed than the Bill in which the clause was embodied. Does this Bill go farther than that? We think it does not. But, at all events, my honourable friends who supported us in 1894, and who supported the House of Lords in 1894, in carrying that clause, are debarred absolutely, in my opinion, from accusing us of any violation of principle in introducing the contracting-out clause which we have put into this measure. But, as to the effect of this clause, Will it prevent contracting out? My honourable and learned friend the Attorney-General (Sir R. E. Webster, Q.C.) put into my hands a few minutes ago a letter from a well-known employer of labour—Mr. George Livesey, the Manager of the South Metropolitan Gas Company, who, it will be admitted, I think, on the other side, is one of the greatest authorities, at all events from the employers' point of view, upon this subject. He writes to my honourable and learned friend; "Your remarks that you believe contracts and arrangements will very generally be made between masters and men will, I hope and think, be fulfilled, for I am sure it will be to the advantage of both." He then goes on to say that the Company and their employees had already settled and adopted a scheme which every man but one, out of some thousands of men, had voluntarily accepted. One pennyworth of experience is worth a thousand pounds of theory. [Mr. MACLEAN: The Gas Company have a monopoly.] What on earth has that to do with it? The sole question is whether, under the terms of the Bill which forbid the employers to contract out except under terms as favourable as those in the Bill, contracting out will or will not be a dead letter. Here we have the best evidence which can be conceived in such a matter—a great Company, even before the Bill becomes law, making such arrangements with their workmen as will conform with the provisions of the Bill. Whatever may be the future of contracting out—and I hope it has a great future before it—let it not be pretended, after this letter, that the provisions of this Bill are a conclusive bar to its being carried out. We have found, as we think, in this Bill, not merely a measure which satisfies every pledge that we have ever given on the subject of employers and employed, but we have found a scheme absolutely in conformity with the Tory traditions of legislation on this subject; violating no principle which this party has ever accepted, imposing no undue burden upon any industry, and better, as we believe, both for employers and employed, than the only conceivable alternative—namely, the Bill of the right honourable gentleman opposite. Having found that solution of this most difficult question, we commend it with confidence to the House, believing fully that the country will endorse what we have done, and will absolutely absolve us from the meanness of motive which some honourable gentlemen on both sides of the House have not hesitated to insinuate has been actuating us in this policy.

The Bill was afterwards read the third time, amid cheers.

The following letter on the above subject, addressed to the Editor of "The Times" by Mr. G. Livesey, was published yesterday:—

SIR,—There appears to be an impression that the Bill will seriously interfere with mutual accident funds, because it is said that employers and employed will have little or no interest in them when the Bill comes into operation. There is doubtless some ground for this opinion; but there are weighty reasons on the other side, which, with your favour, I will try to give. The great defect of the Bill, which perhaps could not be avoided, is its failure to secure the active and intelligent co-operation of workmen in the prevention of accidents; thus relieving them of all responsibility, which is a serious disadvantage to them, and greatly to be regretted. It may, however, be remedied, and the desired result obtained in an infinitely better way by means of mutual funds worked by joint committees of masters and men in all large industrial undertakings. Some of the advantages of such funds are the following: (1) They secure the friendly co-operation of workmen with their employers in the prevention of accidents. (2) By preventing accidents, the cost of compensation will be reduced; and the check which the members of the fund will have an interest in exercising upon unfair claims and malingering will still further reduce the expenditure. (3) The employer will find it to his advantage to pay a definite contribution to the fund equal to the charges the Act imposes for accidents—reduced by care on both sides—to his men, in place of the uncertainty attending the claims under the Act, the disputes as to the amounts, and the references to outside arbitrators. (4) The workmen, in consideration of their contributions, will receive compensation for the first fortnight, and generally on a higher and better scale than under the Act. They also will have the great advantage of obtaining their compensation without question or difficulty of any kind with certainty and without delay. Moreover, the provision can be made in a better form by mutual funds than by the Act. (5) Mutual funds necessitate friendly intercourse between employers and employed, and thereby promote good will. The principle of mutual funds seems in some danger, while, in my opinion, they are more necessary than ever, and to the advantage of both parties. In large industries, they are greatly to be preferred to insurance; being better in every way. As to the workmen's view of the matter, I can only say that in our case they are unanimously in favour of a mutual fund.

THE LIGHTING OF THE THAMES EMBANKMENT.

Electric Light v. Incandescent Gas-Burners.

It may be remembered that about two years ago the London County Council discussed the subject of lighting the Thames Embankment, consequent on the parliamentary powers obtained in 1893 for the purpose. In the end, the Highways Committee were instructed to obtain a number of reports from the officers on various points. From these it was clear to the Committee that the substitution of incandescent gas-burners for those at present in use was inadvisable, as, though no doubt some improvement might be effected by this means in the less exposed portion of the Embankment, it was improbable that there would be any reduction in cost; and in certain places the burners could not be used with advantage, as vibration and other causes would probably reduce considerably the life of the mantles. The cost of fitting new burners to the existing Embankment lamps was estimated at about £500; and to those on the bridges, at about £200. The Committee were informed that the cost of the present system of lighting the Embankment and the two bridges, including the repair of lamps and lighting and cleansing, amounted to about £1300 per annum; while the cost of electric light, if supplied by a company or companies, would be something like £30 per lamp per annum, exclusive of the cost of providing, erecting, and wiring the lamp-columns, lamps, and lanterns, and the expense of maintaining them. The cost of providing electric light for the ornamental gardens of the Embankment, supposing that the plant provided for the lighting of the other parts of the Embankment were used for the purpose, would, it was estimated, be about £2200; but if special plant were provided for the purposes of the gardens, the cost would be about £2600. The Committee were of opinion that it was advisable that, in any scheme for lighting the Embankment, no provision should be made for the ornamental gardens, as it appeared to them to be very doubtful whether any public advantage would be gained thereby. After full consideration of the subject, they came to the conclusion that it was desirable (1) that the Council should establish their own buildings and plant for lighting by electricity the Victoria Embankment—but not the ornamental gardens thereon—and Waterloo and Westminster Bridges; (2) that the lamp-standards should be placed

at the sides of the carriageways, and that the lamps should project over them from the standards, as they had reason to think that the majority of the members of the Council would object to the standards being placed, as was done in some other parts of London, in the centre of the roadway. The first cost of the installation was estimated at £22,000, and the total annual expenditure at £2700. The Committee recommended that the installation should be sanctioned, and that they should be authorized to obtain tenders and enter into contracts on behalf of the Council.

The report embodying the foregoing conclusions came before the Council on Tuesday, when Lord Onslow expressed the opinion that the present lighting of the Embankment was amply sufficient; and he moved that the matter be referred back to the Committee. Alderman Hoare, in seconding the amendment, said he preferred the soft light of the Embankment to the fierce glare of Fleet Street. Mr. Westmacott supported the Committee's recommendation. Colonel Rotton said the enormous improvement in gas lighting at the present time made electric light unnecessary. He was sure the incandescent gas-light was of such a character that electric light was not now wanted. The Council could get light by this means quite as good as, and much cheaper than, by electricity. Mr. Thornton pooh-poohed the idea of using incandescent-gas-light, which, he said, was a failure for street lighting purposes. Mr. Emden contended that the duty of the Council was to make experiments with incandescent gas-lights, just as other districts in London had done. Sir J. Lubbock said he thought there was a great advantage in using electric light; but he preferred the incandescent to the arc system for street lighting purposes, because the latter cast dark shadows, while the former diffused the light. He did not think the arc light added to the beauty of cities; and he said this after seeing many Continental cities lighted by electricity. Sir J. Dimsdale said he should vote against the proposal of the Committee, as it was found that the electric light would not penetrate fogs so well as gas. As the Embankment was subject to fogs, he thought it prudent for the Council to take care that the best light was afforded. He was glad that for once they had a subject free from party politics; and he besought the Council to pause before they introduced a system which, so far as the Embankment was concerned, had been pronounced a failure. Dr. Longstaff condemned the proposal of the Committee. He said the electric light was unsteady, was hurtful to the eyes, and cast shadows. Earl Russell (the Chairman of the Committee) said he could not hold out any hope that so large a place as the Embankment could be effectively lighted by incandescent gas-light. In the opinion of the officials, it was unsatisfactory for open-air purposes, and had been given up in many places where it had been tried. The recommendation of the Committee had found favour among all the members of the Committee; and the Council might therefore know that the scheme had been thoroughly considered. On a division, the amendment was rejected by 63 votes to 43. The Committee's recommendation was agreed to, with the proviso that they are to report further to the Council as to the details of the scheme.

THE ACCIDENT TO THE ROPE-GUIDED HOLDER AT MIDDLESBROUGH.

At the Meeting of the Middlesbrough Town Council last Tuesday,

Mr. Alderman Hugh Bell, the Chairman of the Gas Committee, moved, in reference to the accident to the rope-guided gasholder (upon which a report by Mr. Henry Woodall appeared in last week's issue), "That the offer contained in Messrs. Ashmore, Benson, Pease and Co.'s letter of June 15 be accepted, the cost of the repairs over and above those provided for in that letter to be made the subject of a contract with them, of which the amount should be settled between them and the advisers of the Corporation." Alderman Bell said it appeared to him that to endeavour to offer explanations and defend the position in which the Gas Committee found themselves, would be like "crying over spilt milk." They were in a position of being compelled to consider a very awkward situation, and determine what was the best way out of it. There was no doubt the Council for some reason found themselves in a very awkward hole. He hoped the members would not approach the subject in any partizan spirit; and he urged them to consider whether, being in the position in which they found themselves, they ought not to accept the offer which the Contractors for the holder had made them. It was absolutely necessary that the holder should be reinstated for the coming winter season. He feared that if the Council did not accept the views which he had urged upon them, he should feel that his services were not of the use to the Gas Committee which he had perhaps thought them to be, and that it would not be wise on his part to longer occupy the position of Chairman.

Mr. T. Carter seconded the motion.

Mr. T. Baker moved, as an amendment, that the Council call upon the guarantors to forfeit £5000, and that with this sum they put the holder into a workable condition as soon as possible. He was of opinion that the holder was a failure; and the least they could do was to call for the forfeiture of the guarantees.

Mr. J. Benfield seconded the amendment.

Alderman Bulmer observed that to call upon the guarantors would mean going to law; and it would be difficult to make any Court believe that the Corporation were not themselves the defaulters in the matter of the foundations.

Other members supported the motion.

On a vote being taken, only five members were in favour of the amendment and 24 against it, and the original motion was then carried.

Oldham Out-Districts and the Price of Gas—The agitation for a reduction in the price of gas in the out-districts of Oldham is being revived; the Failsworth District Council being the movers in the matter. They have asked the neighbouring local authorities to take part in a conference to consider whether the Oldham Corporation are not making out of their gas undertaking a greater profit than they are entitled to, and whether, considering the large profit, the price of gas supplied to the out-districts should not be reduced. It is thought that, if the out-districts are united in pressing their claim, they will obtain a reduction.

SOUTHPORT CORPORATION GAS SUPPLY.

The Annual Accounts.

In the "Journal" last week, we gave a few figures from the annual report of the Gas Engineer of the Southport Corporation (Mr. J. Booth). It is accompanied by the accounts for the year ending March 31, which show that in this period there was expended for capital purposes £18,466; bringing up the total outlay to £221,126. This works out to £6 5s. 8d. per ton of coal carbonized, and 12s. 4d. per 1000 cubic feet of gas sold. The items forming the first-named total include £4350 spent on water-gas plant, £6918 on mains, and £3606 on gas cooking-stoves. The last item appears for the first time in the capital account; the amount stated being a portion of £5000 obtained under the Provisional Order of 1895, which it may be remembered empowers the Corporation to borrow £10,000 for the purchase of cooking appliances, repayable in ten years. While on this subject, it may be mentioned that the system of letting out gas-stoves on hire was introduced in July, 1896; and up to the 31st of March last 532 cookers had been let, 18 placed on the hire-purchase system, and 10 sold; while 115 gas-fires had been let and 13 sold. The business in connection with this department is increasing weekly, and it has entailed a largely increased expenditure on revenue account—all new meters being paid for out of revenue. The net receipts from the sale of gas in the past financial year amounted to £45,546; from public lighting, to £3992; from the hire of meters and stoves, to £841; from the sale of residual products, to £9464; rents produced, £913; and service-pipes and fittings, meters and fixing, and lamps, £743. The stock on hand at the close of the year was valued at £14,797; and the total receipts on revenue account were £76,789. With regard to expenditure, the manufacture of gas cost £36,435, of which a sum of £22,322 was for coal, gas oil, and cannel, £7939 for salaries and wages, and £6011 fo maintenance; distribution entailed an expenditure of £6415; management cost £2277; and interest and sinking fund payments came to £7350—the total outlay being £67,750. The balance was therefore £9039, as compared with £10,099 in the preceding year. As mentioned last week, the quantity of gas sold was 356,640,800 cubic feet. Dealing with the principal figures on the expenditure side of the revenue account on this basis, we find that the expenses of manufacture amounted to 2s. 0·67d. per 1000 cubic feet (coals costing 1s. 3·32d.); distribution cost 4·09d.; and management and miscellaneous charges came to 3·51d.—together, 2s. 8·27d. On the other hand, residuals produced an amount equal to 6·34d. per 1000 cubic feet; and rentals and miscellaneous receipts, 1·99d.—together, 8·33d.; deducting this from the 2s. 8·27d., there is left 1s. 11·94d; and adding the interest and sinking fund payments 4·92d., makes 2s. 4·86d., the net cost per 1000 cubic feet of gas sold. Two of the appendices to the accounts show the growth of the gas undertaking since 1884. In that year the capital amounted to £158,683; and the net profit to £4646. The quantity of gas made was 184,238,000 cubic feet, of which 153,723,900 cubic feet were sold, as measured by 6174 meters, 18,392,700 cubic feet for public lighting in 1351 lamps, and 8,988,600 cubic feet were unaccounted for. In the financial year covered by the accounts under notice, the capital was £221,126; the net profit, £9039; the make of gas was 374,223,000 cubic feet, of which 325,288,000 cubic feet were sold through 11,117 meters, and 31,352,000 cubic feet for public lighting in 2031 lamps; and the gas unaccounted for was 14,836,200 cubic feet. At the Town Council meeting last Tuesday, Mr. Dimond, in moving the adoption of the minutes of the Gas Committee, called attention to Mr. Booth's report, and said he thought it was very satisfactory. Alderman Fisher having seconded the motion, Mr. Travis remarked that, as last year he had occasion to criticize the report, he had all the greater pleasure this year in complimenting the Committee. He was glad to find that the make of gas was considerably higher; and he must testify his approval of the action of the Committee in giving the Council a fuller report than before. The minutes were passed.

STOKE-UPON-TRENT CORPORATION GAS SUPPLY.

The Annual Accounts—An Electric Lighting Scheme.

The accounts of the Gas Department of the Stoke-upon-Trent Corporation for the year ending March 31 came before the Town Council at their meeting last Thursday—the Mayor (Mr. F. Geen) in the chair. They showed that the revenue from public and private lighting was £14,655; and that derived from the sale of residuals, £3173—the total receipts being £17,842. The expenditure being £9447, the gross profit on the year's working was £8395. After meeting the charges for interest, &c., there was a net profit of £5043. The accounts were accompanied by the working statement of the Engineer and Manager (Mr. W. Prince). According to this, the capital employed in the undertaking is £72,869, or nearly £7 per ton of coal carbonized, and about 15s. per 1000 cubic feet of gas sold. The sale of gas last year was 96,915,200 cubic feet, or 91·63 per cent. of the total quantity delivered. The bulk of coal carbonized was 10,426 tons, from each of which 10,139 cubic feet of gas were made, and 9295 cubic feet sold. With regard to residuals, 34·32 per cent. of the coke made was used as fuel, and what was sold yielded 7s. 11d. per ton; tar realized at the rate of 1·46d. per gallon; and ammoniacal liquor, 8s. 9d. per ton. The net proceeds of the residuals were at the rate of 77·57 per cent. on the cost of coal. The Gas Committee in their report recommended that a remittance of £1000 be made to the Council on account of the current year's profits, and that the question of electric lighting be discussed by the whole Council in Committee. The report having been formally moved and seconded,

The Mayor, in supporting the motion, said the members of the Corporation would have noted with the highest satisfaction the very satisfactory outcome of the year's trading shown by the accounts—the excellent results of the previous year having been considerably improved upon. After paying and providing for all liabilities, there was a net profit of £5043, which was the highest amount earned in any one year by the Corporation. To this was to be added the undivided profit or working capital brought forward from the previous year, amounting to £6644, which made a total of £11,687, which the Committee had to deal with. Out of this, £2500 went to the relief of the district rate, £123 to

the sinking fund, and £1829 for permanent additions and improvements to the works. These sums together made £4452, leaving £7235 as undivided profits, which were carried to the current year's accounts. This sum was in addition to the reserve fund of £5228, which did not exist upon paper only, but was in cash at the bank and in investments. The Committee, he might say, had always kept three points before them. First, the delivery of gas of good quality; secondly, economical and profitable working; thirdly, proper and reasonable additions to the works. As to the first of these points, he claimed that they had been entirely successful. There had, of course, been some complaints; but he had found that, out of every 100, 90 were due either to indifferent fittings, bad burners, or something of the kind. As regarded the second point, the profits themselves gave the answer to it. With respect to the third, he thought the Council and the burgesses might rest assured that new gas-works would not be required in their day or generation. With regard to the question of electric lighting, he believed the opinion of every member of the Corporation was in favour of it. They believed it would be a valuable adjunct to the gas-works, and it would, if adopted—and he was sure it would be adopted speedily—put them in a very good position as compared with their neighbours and with any other town in the Midlands. The only question had been as to when the light should be introduced. He might say that for years he had held the opinion that it would be a very wise and proper step to take to adopt the electric light. But as they had had a good deal to attend to at the gas-works in putting them upon a proper footing, he personally had never seen his way to deal with two large and extensive matters at the same time. Now, however, that they could see the end of the improvements and alterations required at the works, and as it would probably take twelve months to get a Provisional Order to enable them to start providing the electric light, he thought they could not do wrong, when they came to discuss the matter in Committee, to decide to take immediate steps for its adoption. But if they were to have electric lighting, the Corporation were the proper body to undertake it; and they would not permit any outsiders to come there and monopolize anything that ought to be worked for the benefit of the ratepayers as a whole.

The report was adopted; and the whole subject having been discussed by the Council in Committee, it was unanimously resolved that immediate steps be taken to promote a Provisional Order for electric lighting purposes.

HINCKLEY DISTRICT COUNCIL GAS-WORKS.

Local Government Board Inquiry.

Last Tuesday, Mr. G. W. Wilcox sat at the District Council Offices, Hinckley, to receive evidence regarding an application by that body to the Local Government Board for power to borrow, among other sums, £9500 for gas-works purposes.

Mr. J. Preston, Clerk to the Council, stated that the present gas-works loans amounted to £40,000, and a further £9500 was now required for extensions. The works were acquired by the late Local Board in 1881; the purchase price being £30,500. Adding expenses made a total of £33,177; and by the Act they were empowered to borrow £40,000. After the purchase, there was a balance of £6820, all of which had been since expended on new works; and up to March, 1896, a further £626 was spent. The £9500 now asked for included the last-named sum; and beyond that there was also included in the estimate £306 for new mains and £1000 for land purchased since March, 1896.

Mr. *G. Helps*, the Engineer and Manager, gave in detail the items composing the estimate. He pointed out that the purchase of the land referred to was made for the purpose of extending the works. The land was freehold; and the purchase money had been paid. The total sum spent from 1896 up to date was £1932. The accounts of all expenditure prior to 1896 had been audited; but the accounts since had not.

The Inspector remarked that the Local Government Board might object to consider these items on account of their not being audited.

Mr. Preston pointed out that the items had been carried to the suspense account, and brought forward from year to year until the loan was granted.

Mr. *Helps* (proceeding) said the existing engine and boiler were worn out, and were below the power now required. It was proposed to build a new house for the reception of a new engine and boiler; the present house not being large enough. The old plant had been valued at £100. It was intended to put down a 10-inch station meter. They would also be able to test the gas, and would be in a position to make gas much better. Many complaints were now made about the quality of the gas; and it was hoped to obviate that in the future. The new meter and testing apparatus would be placed in a house specially built.

Mr. Preston, in answer to the Inspector, said that section 33 of the Special Act stated that the money to be borrowed should be repaid within a period of fifty years. The Council desired it for fifty years, as in the case of the present loans.

Mr. *Helps* read the following extract from a report by the Gas Committee: "We are calculating on the Local Government Board's sanction to repay the new loan in fifty years. We are already over-burdened with capital compared with other undertakings; and consequently there is a tendency to keep up the price of gas, and so hinder motor-power users from putting down gas-engines. It is a matter of the greatest importance to us that the day consumption of gas should be encouraged in every way."

Mr. *George Kinton*, Chairman of the Gas Committee, said that application was made in 1894 for power to borrow £5000. At that time the Local Government Board would not entertain it in consequence of the Council being something like £2000 in arrear with the sinking fund; but now the sinking fund was made clear up to date. When the gas-works were purchased, the annual make of gas was about 18,000,000 cubic feet; and in 1896 it was 46,000,000 cubic feet. The price now to private consumers was 3s. 6d. in Hinckley, and 4s. 3d. in Burbage. To manufacturers it was 3s. 3d. in Hinckley, and 4s. 2d. in Burbage. He hoped the Inspector would do his best to get the loan for fifty years, as Hinckley was heavily burdened on account of several loans. They had had to spend £50,000 on the water supply.

No one appeared in opposition; and the other subjects for inquiry were then considered.

SALES OF STOCKS AND SHARES.

Messrs. Nightingale, Phillips, and Page recently sold by auction gas stock and shares in Suburban Gas Companies of the capital value of £1900. "A" Stock in the Mitcham and Wimbledon Gas Company was disposed of at an average of £241 per cent.; £10 shares (£6 per share paid) in the same Company produced an average of £16 10s. per share; and a £50 3½ per cent. mortgage bond went for £53. Some £10 shares in the West Kent Gas Company fetched £20 each; and a few £10 new issue shares (£4 per share paid up) found buyers at £8 per share. Four lots of £50 consolidated "C" stock in the Croydon Commercial Gas Company produced £220 per cent. Some £10 shares (Carshalton capital), £6 per share paid up, in the same Company, were purchased for £14 15s. each. The total sum realized by the sale was £3705 10s.

The following shares have recently been sold by auction: Some £10 shares of the 1859 capital of the Bury St. Edmunds Gas Company, for £22 10s., £22 5s., and £22 each. Four £10 shares of the 1849 capital of the same Company fetched £26 15s. each. Some £10 shares in the Woodbridge Gas Company realized £22 10s. and £22 15s. apiece. A few £30 original shares in the Dudley Gas Company have just been submitted to public competition, and were secured for £67 10s. each. Some £10 additional shares were purchased for £23 apiece. Six perpetual Rochdale Corporation Water-Works annuities of £4 4s. each have lately changed hands, at a local sale, at £144 each.

THE GAS AND WATER ORDERS OF THE SESSION.

The Board of Trade have issued memoranda stating the nature of the proposals contained in the Provisional Orders included in the Gas and Water Provisional Orders Bills of the present session.

The Gas Orders Confirmation Bill (No. 1) contains Orders relating to Hoylake and West Kirby, Killamarsh, Sedbergh, and Westbury. The first-named Order is to empower the Hoylake and West Kirby Gas and Water Company, Limited, to raise additional capital, not exceeding £9000 by shares and £2250 by loan. The Killamarsh Gas Order is to authorize the Killamarsh Gaslight and Coke Company, Limited, to construct and maintain gas-works, and to make and supply gas within the parish of Killamarsh, in the county of Derby, and to sell gas in bulk, by agreement, beyond the limits of supply; also to fix the capital at £5000 by shares and £1250 by loan, and the maximum price to be charged for gas at 5s. per 1000 cubic feet, with power to the Board of Trade, after three years, to alter the maximum, or to name a standard price with sliding-scale as to price and dividend. The Sedbergh Gas Order is to enable the Sedbergh New Gas Company, Limited, to maintain and continue gas-works, and to manufacture and supply gas in the township of Sedbergh, in the West Riding of York. The capital is to be £9000 by shares and £2250 by loan; and the maximum price to be charged for gas is 5s. 10d. per 1000 cubic feet, with power to the Board of Trade, after three years, to alter it or to fix a standard price with a sliding-scale. The Westbury Gas Order is to empower the Westbury Gas and Coke Company, Limited, to maintain and continue gas-works, to construct and maintain additional works, to purchase lands, and to manufacture and supply gas within the parishes of Westbury, Upton Scudamore, Dilton Marsh, Bratton, Edington, and Heywood-cum-Hawkeridge, in the county of Wilts, and to sell gas in bulk, by agreement, beyond the limits of supply. The capital is to be £15,000 in shares and £3750 on loan; and the maximum price to be charged for gas will be 4s. 4d. per 1000 cubic feet, with power to the Board of Trade, after three years, to alter it as in the other cases.

The Gas Orders Confirmation Bill (No. 2) contains orders relating to Cradley Heath, Harrogate, and Wimborne Minster. The Cradley Heath Order is to empower the Cradley Heath Gas Company to raise additional capital, not exceeding £20,000 by shares or stock, and £6750 by debenture stock, subject to the auction clauses. The standard price to be charged for gas is fixed at 3s. 2d. per 1000 cubic feet for reduction of dividend, and 3s. 1d. for increase of dividend; and the Company are to be authorized to sell gas in bulk, by agreement, beyond the limits of supply. The Harrogate Order is to empower the Harrogate Gas Company to extend their existing works, to construct works for the manufacture of residual products, to sell gas in bulk by agreement beyond the limits of supply, and to raise additional capital, not exceeding £80,000 by shares or stock, and £20,000 by debenture stock subject to the auction clauses. The Wimborne Minster Order is to authorize the Wimborne Minster Gas and Coal Company, Limited, to maintain and continue gas-works, to construct additional works, and to manufacture and supply gas in the parishes of Wimborne Minster and Colehill, in the county of Dorset, and to sell gas in bulk by agreement beyond the limits of supply. The capital is fixed at £17,000 by shares and £4250 by loan; and the standard price to be charged for gas is 4s. 1d. per 1000 cubic feet, with a sliding-scale as to price and dividend.

The Water Provisional Orders Confirmation Bill contains Orders relating to Barton-upon-Humber, Bridge of Allan, Frith Hill, Godalming, and Farncombe District, Gosport, Newmarket, Royston, and Steyning and District. The first-named Order is to empower the Barton-upon-Humber Water Company, Limited, to maintain and continue water-works, and to supply water in the parishes of Barton-upon-Humber, Barrow, and Goxhill, in the Parts of Lindsey, in the county of Lincoln. The Order granted in 1885 is revoked. The Bridge of Allan Order is to enable the Bridge of Allan Water Company to extend and improve their works and raise additional capital; and the Orders applied for by the Frith Hill, Godalming, and Farncombe Water Company and the Gosport Water Company have similar objects—the last-named Company desiring also to extend their limits. The Newmarket Order is to sanction the raising of additional capital. The Royston Order is to empower the Royston Water Company, Limited, to maintain and continue water-works, and supply water in the parishes of North Royston, South Bassingbourn, South Kneesworth, South Melbourn, South Royston (otherwise called Royston), and part of the parish of Therfield, in the county of Hertford. The Steyning and District Order is to authorize the construction and maintenance of water-works, and the supply of water to the town and parish of Steyning, and the parishes of Bramber and Upper Beeding, in the county of Sussex.

ELECTRIC LIGHTING NOTES.

Mr. R. H. Bicknell held an inquiry at Walsall last Thursday in regard to a proposal of the Corporation to borrow £1851 for the extension of the electric lighting undertaking. The present supply was stated to be equal to 6357 lamps, and the department have applications representing 350 more.

Last Tuesday the first installation of electricity for public lighting purposes in the Isle of Man was inaugurated at Onchan, the enterprising town to the north of Douglas. It was decided, among other things, to light the town with electricity in celebration of Her Majesty's Diamond Jubilee; and the necessary arrangements were made with the Isle of Man Electric Power Company.

At the meeting of the Bridgwater Town Council last Thursday, a long report was presented by the Electric Lighting Sub-Committee; and its consideration resulted in a decision to carry out a low-tension system of electric lighting in the borough at an estimated cost of £14,672. The Town Clerk has been instructed to take the necessary steps to obtain a Provisional Order for the purpose.

At the meeting of the Burton-upon-Trent Town Council last Wednesday, the Gas and Electric Light Committee reported that they had received a report from the Engineer and Manager (Mr. F. L. Ramsden) on the Brighton system of charging for electrical energy otherwise than by agreement; and Alderman Lowe stated that at the next meeting of the Council he would move a resolution to sanction an alteration in the charges for electric light in the borough, based upon that system.

The Bootle Town Council last Wednesday adopted a scheme of electric lighting - only just in time to come within the period specified in their Electric Lighting Order for making a commencement in the putting into operation of the powers conferred upon them. The scheme provides for a plant suitable for the supply of electrical energy for 18,000 8-candle power lamps, assuming that not more than 60 per cent. of them are in use at any one time. The cost is estimated at £31,000, exclusive of the buildings and the excavation and reinstatement of roads. The Council have decided to borrow £35,000 for the purpose.

The Yarmouth Corporation's speculation in electric lighting continues to show a balance on the wrong side, and is likely to do so. In June there was a surplus, in round figures, of £14 to meet a monthly capital charge of £170. The Surveyor, who has been presented with a gratuity of £200 for his work in connection with the electric light, maintains that at the end of the year the deficit will only be £400; but it must be remembered that it was he who estimated that the loss for the first two years would be £1500. About £30,228 has been spent out of the £35,200 sanctioned, and the balance will be required to meet outstanding debts; besides which, since 1895, a sum of £1492 has been provided from the rates. The Surveyor says the undertaking will pay when all the lights are taken. This may be so; but the "when" may be a long way off.

At the meeting of the Commissioners of Sewers of the City of London last Tuesday, the Streets Committee brought up a report relative to the action, if any, to be taken by the Commissioners in the interests of private electric light consumers. They recommended that the City of London Electric Lighting Company should be informed that, failing any permission to the contrary, the Commissioners should insist in future on due observance of the terms in the agreements in regard to the amounts to be debited for depreciation in the account of receipts and expenditure. Mr. A. C. Morton complained of the heavy charges made by the Company to private consumers, and said the Commission had been badly advised in entering into agreements in reference to the electric lighting of the City, and had been taken in all round. Some people were said to have made about £200,000 out of the contract with the City; but it had been a bad bargain for the ratepayers. Every effort, it was said, had been made to induce the Electric Light Company to abate their charges; but the reply to all was that it could not be done at present. The report was approved.

The Bradford Corporation Gas and Electricity Supply Committee are carrying their electric lighting system into some of the outer districts; and for this purpose additional capital to the amount of £50,000 is required. The members of the City Council were asked by Mr. Aykroyd, at their meeting last Tuesday, to allow the Committee to make an application to the Local Government Board for authority to borrow this amount. He informed his colleagues that the capital of the department was now £120,000. The last £40,000 borrowed was required for the establishment of new works; and when the liabilities incurred for this specific purpose had all been met, the sum would be exhausted. The £80,000 borrowed for the old works had all been spent; and there was, in fact, a considerable overdraft in connection with the department. The Corporation would, he thought, be glad to find that the electricity works were growing rapidly; and the Committee were taking care when pushing electricity not to enter into unreasonable competition with the gas-works. In carrying the cable to Heaton, for example, they had in mind the fact that the people there were being supplied with gas at a rather extravagant price; and the extension would place residents in Heaton in the same position as those in more favoured districts. The Committee would, he thought, be glad to apply the same principle to Allerton. The extensions were very costly, about £24,000 having been spent during the last eighteen months in cables and mains. But in view of the profit shown last year, the Council would, he hoped, vote the money. This was at once done.

There is without doubt a strong feeling of discontent in the Corporation of Dublin in reference to the affairs of the Electric Lighting Department. How is it, asked Mr. Thompson at last week's meeting of the Corporation, that, after five years, the concern is not self-supporting? But no one appeared to know; and some attributed it to one thing, and others to another. Alderman Beattie thought that the non-success was due to bad management; but he freed from all blame the Chairman of the Committee (Mr. W. Buckley), who, he said, was doing his best to get things into a better state. He declared that it was too bad, after all the money that had been spent on the plant, that the Corporation should find it obsolete. Mr. O'Hara considered the fault was to be found in the restricted dimensions of the electric light station, and Sir Robert Sexton believed that when the new station was started there was a prospect of a very successful career for the undertaking. These remarks seem to have irritated Mr. Buckley; for, in replying, he spoke somewhat at random. He said: "If the Council wanted the Chairman of the Electric Lighting Committee, whose name was William Buckley, and the Committee of which he was the Chairman to light the city, let them bestow on them one-and-a-quarter millions of stock; and they would light Dublin inside and out, night, noon, and morning, at 2d. per Board of Trade unit, for which they now charged 7d." The Dublin Corporation, he added, were one of the first to take up electric lighting. But the station was too small; and it was beset with difficulties which no other electric light undertaking had to face. They had, however, paid off £10,000 of the capital, besides meeting the interest.

THE LONDON COUNTY COUNCIL AND THE WATER QUESTION.

The Council and the Water Commission.

At the Meeting of the London County Council last Tuesday—Dr. W. J. Collins in the chair—the report of the Water Committee, to which reference has already been made in the "Journal," indicating the points upon which, in their opinion, evidence should be given by the Council before the Royal Commission on Water Supply, was under consideration. It set forth that the Committee had sent to the Commission a table showing the various matters connected with the question of the Metropolitan Water Supply upon which the Council would be able to give evidence; but that this preliminary table has been purposely so drafted as merely to present facts, and not to put forward opinions upon policy. The Committee were, however, considering the evidence to be presented by witnesses on behalf of the Council, and had come to the conclusion that there were certain main principles upon which the Council should express their opinion for the guidance of the witnesses. They had therefore prepared a series of resolutions which they believed would represent the opinion of a large majority of the Council. Having dealt with the subject matter of these resolutions, the Committee said they thought the Council should express some opinion as to the necessity, in the event of no purchase of the water undertakings being carried out, of some radical change in the conditions under which private Companies are to be permitted to supply water to the Metropolis. "It is clear," they said, "that the irresponsible position occupied by the existing Companies cannot continue, and that, if purchase does not take place, Parliament will be asked to materially cut down the powers of rating, to limit the dividends, and generally to revise the whole of the existing financial arrangements; also to place the Companies under much stricter obligations to supply pure water and to provide adequately for the future needs of the Metropolitan water area." The report concluded with the following recommendations:—

1.—That, in the opinion of the Council, the water supply of the Metropolis should not continue in the hands of private companies.

2.—That, in the opinion of the Council, the undertakings of the Metropolitan Water Companies should forthwith be purchased at the fair and reasonable value of the same; regard being had to the rights, special circumstances, and obligations of the Companies.

3.—That the management of the water supply should be effected either by the London County Council supplying its own area directly and outside authorities in bulk at a fixed price; or by the London County Council supplying its own area only, and the outside authorities supplying their areas; or by a new body supplying directly the whole area both within and without the county.

4.—That, in any case, as the County of London contains 87 per cent. of the rateable value, and over 79 per cent. of the population, of the whole area supplied by the Metropolitan Water Companies, and will thus be liable for more than four-fifths of the purchase-money, it is desirable that the London County Council should, in the first instance, be the purchasing authority on behalf of the population of the whole area concerned.

5.—That if the undertakings of the Water Companies are not acquired it is essential that effective powers of control should be given to the County Council, and further that the position of the Companies should be reconsidered and the law amended, particularly as regards their power to make and recover rates and charges and divide profits, and their obligations respecting the supply of water.

Alderman Dickinson moved the adoption of the report; and, on a division, the motion was carried by 57 votes to 40.

The Vice-Chairman (Alderman Beachcroft) then moved an amendment to the first recommendation—"That, in view of the reference of the Royal Commission, it is undesirable that the Council should pass any further resolutions affecting the acquisition of the water supply of the Metropolis; and accordingly that the recommendation be referred back to the Committee for further consideration." He said he hoped the Council were not going to discuss their water policy all over again. He was in favour of the water supply being in the hands of the Municipality, but not in favour of confiscating the property of the Water Companies. He could not follow the policy of immediate purchase while a scheme was in the air to spend £19,000,000 in bringing a supplemental supply of water from Wales. He felt that a mistake had been made by the Committee in bringing up abstract resolutions such as those now submitted.

Lord Dunraven, in seconding the amendment, said he failed to see that the Council could depute anyone to give evidence on policy when the Council were divided on the wisdom of this or that scheme. With the multiplicity of opinions on this subject, how was it possible for any member to represent their views? The only way was to take a division, and send the result with the list. He had no objection to any member giving his individual views to the Commission; and he was of opinion that it would be much more sensible if the Council, in their future debates on their water policy, were guided by the views of the Commission.

Mr. J. Stuart, M.P., laid down the policy of the Progressives; pointing out that the Council had been directed by Sir Matthew White Ridley's Committee to express an opinion, which the Moderates were averse to giving. If they were divided, then let the Commission know it. The amendment sought to abandon the whole of the duties and responsibilities of the Council, simply because a Commission had been appointed to investigate the policies of the parties. If this were not the purpose of the Commission, it was a fraud, for Mr. Chaplin had advanced the argument against the Council's Bills that they had not made up their minds as to the best policy to be adopted.

Mr. P. Harris said the Water Committee had evaded facts and figures, and had devoted themselves to trying to get such evidence as would in

their opinion nullify the value of the Commission appointed by the Government. While he was in favour of purchase, he wanted to know what the terms were to be, and what was to be the system of management when the Companies' undertakings were brought under the control of the Council.

Mr. M'Dougall called attention to the pollution of the Thames near Goring from sheep washing, and said he did not think such a state of things should be allowed, or that a municipal body having the care of people who drank such water should be powerless to prevent the pollution. He added that the Water Companies had written to the Thames Conservancy stating that they had a difficulty in filtering the water taken from the river.

Sir J. Lubbock, Bart., M.P., supported the amendment.

Mr. M'Kinnon Wood averred that the object of the amendment was to prevent the Council from putting the ratepayers' case for purchase before the Commission.

Lord Onslow, replying to the last speaker, said it was, no doubt, an ingenious manner of presenting a case before a Royal Commission; but the proper way would be for members in their individual capacity to give their views to the Commission, or at all events those of the section or party to which they belonged. It was idle to pretend that the Council had decided upon certain courses by a large majority; and any attempt to put this view before the Commission would break down under cross-examination. The next best thing for the Committee to do was to print and submit the whole history of the water question as dealt with by the Council, and leave the Commission to form their own judgment.

The Council divided on the amendment, and it was lost by 35 votes to 54.

Dr. Longstaff moved a further amendment—"That, in the opinion of the Council, the water supply of the Metropolis should not continue wholly in the hands of private Companies, but should be under effective control." He was speaking in support of this amendment at seven o'clock, when

Mr. Cornwall moved that the Standing Orders should be dispensed with, and the sitting continued until the Water Committee's report had been disposed of.

This was agreed to; but upon a count, it was found that the necessary number of members were not present. The Council thereupon dealt with the unopposed business, and adjourned.

WOLVERHAMPTON CORPORATION WATER UNDERTAKING.

Annual Report and Accounts.

Reporting upon the working of their department during the financial year ending March 31, at the meeting of the Wolverhampton Town Council yesterday week, the Water Committee stated that the profit for the year, after paying interest on the capital and sinking fund, amounted to £5262, out of which £3500 would be transferred to the credit of the improvement fund. The total income during the year was £27,453, which did not reach that of either of the three previous years. The total expenditure was £22,191, which was the least for six years; and the profit was larger than in any preceding year. The working expenses amounted to £11,373; and the percentage of working expenses to gross receipts was 41·4 per cent.—the net earnings during the year being £16,080. The quantity of water pumped in the year was 2071 million gallons; and the coal consumed, 10,195 tons. The daily average consumption for all purposes was 2,766,027 gallons. The estimated number of houses in the borough was 19,275, of which 18,660 were supplied with water from the water-works. There were, therefore, about 615 houses in the borough, the inhabitants of which were dependent upon wells for their supply, or obtained it some other way. There were 7735 houses outside the borough supplied with Corporation water. The number of meters in use was 421. Regarding the water supply to Bilston, the Committee stated that the District Council had completed their new works, and had given notice of their ability to supply water to the township. The Committee therefore ceased to furnish a supply on July 2, 1896; and the sum of £9000 due to the Corporation, under an agreement of 1892, was paid on July 25 last. Further, in accordance with the terms of an agreement dated Sept. 2, 1895, the Bilston Council obtained an Act authorizing the transfer to them by the Corporation of the mains and water-rights of the Coseley district, and of the main from Goldthorn Hill to Bilston; and the purchase-money, in respect thereof—viz., £7750—was duly paid on Aug. 28. By the provisions of the Bilston Water Act, 1893, and the Bilston Improvement Act, 1896, the £9000 and £7750 can be applied to any purpose of the water-works for which the Corporation may have an authorized unexhausted borrowing power, or which may be approved of by the Local Government Board, or else paid to the credit of the loans fund in reduction of the Corporation debt. The report was adopted.

COVENTRY CORPORATION WATER ACCOUNTS.

The accounts of the Water Department were before the Coventry City Council at their last meeting. The receipts from water-rents, it was stated, had been the largest in the history of the undertaking, amounting to £9746, against £8117 in the preceding year. On the other hand, the expenses had been exceptionally heavy, principally owing to the large outlay on the extension and enlargement of mains. Another heavy item was for meters, owing to the increase in the demand for water for manufacturing purposes, and the operation of the new scale of charges, whereby a large number of additional meters had become necessary. The balance of revenue over working expenses was £3011, to which must be added bank interest, £58; making a total of £3069. Of this, interest on loans absorb £1700; and the annual instalment to the sinking fund, £401—leaving a balance of £967, which, in view of proposed heavy repairs to the engines, it was recommended should be carried forward. In moving the adoption of the report, Alderman Read stated that the water-works had been established about fifty years, and independently of paying the cost of the old works out of the profits, there had been paid towards the old works during that time £12,550, and towards the new works, including the reservoirs, £12,300. There had also been transferred to the borough fund £16,619, making a total of £41,469. The water-works had materially relieved the rates in the past; and though, by reason of the expansion of the city and the need for extensive renewals, there would be a temporary cessation in the profits to be handed over to the borough fund, he hoped the increased revenue which was anticipated would soon place them in a position to resume the policy which had hitherto been followed. The report was adopted.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

Mr. R. S. Carlow, of Arbroath, the Secretary of the North British Association of Gas Managers, has sent me the official programme of the meeting of the Association, which is to be held in Ayr on Thursday, the 29th inst. The programme card is very prettily printed; appropriately showing several views of scenes and incidents illustrative of the life or writings of the poet Burns. There are only three papers to be read. The Committee seem to me rightly, for this year, considering the place of meeting, to rely more upon the festive element than upon business subjects to draw the members out. The quality of the papers must be left out of account in the meantime; but on the social side, it is not out of place to say that I do not think the members of the Association ever had a more attractive scheme of amusement prepared for them.

The accounts for the past year in connection with the Port-Glasgow Corporation gas undertaking, were presented this week, at a meeting of the Town Council. They showed that, while there had been a net increase in revenue of £420 beyond the estimate, there had been an increase in expenditure of £978; giving a deficiency on the year's working of £424. The quantity of coal used for the year ending May, 1896, was 3560 tons, compared with 5143 tons last year. The tar and liquor sold was 212,290 gallons for last year, against 141,294 gallons for the year ended May, 15, 1896; and the quantity of gas made was 29,760,790 cubic feet, compared with 31,597,350 cubic feet for the year ended May of this year.

The Auditor to the Town Council of Kirkintilloch has reported a surplus on the Corporation gas account of £175; and he has also called attention to the fact that, although last year the price was reduced 3d. per 1000 cubic feet, the revenue from the sale of gas shows an increase of £37 during the past twelve months.

The Johnstone Gas Commissioners report that, during the past year, they had a revenue from gas of £5155; and from secondary products, of £366. Their gross profit amounted to £3832; and the net profit, to £186. They are able to reduce the price of gas 2½d. per 1000 cubic feet. Bad debts only amounted to £13.

At Dumfries, on Monday, the annual meeting of the Gas Commission was held. The report by the Manager (Mr. G. Malam) stated that during the year to May 15, the quantity of gas manufactured amounted to 73,034,000 cubic feet, as compared with 68,723,000 cubic feet in the year preceding. The yield of gas per ton was 10,104 cubic feet, as compared with 10,107 cubic feet. The quantity of gas sold, excluding that used on the works, was 64,770,000 cubic feet. Unaccounted-for gas amounted to 11·71 per cent. Ordinary renewals of meters cost £103; and £3640 was paid for new meters. Renewals of mains and services cost £251. The erection of a new retort-bench had been satisfactorily carried out. After August, 1899, there would be a reduction of about £406 in the annual payment of interest, as a sum of £4000, borrowed in 1885, would then be paid off. It was proposed, in connection with a loan of £25,000, which was borrowed in 1878, and of which, in August, 1899, there would only remain £12,500 to be repaid, to endeavour to get the interest reduced from 4¼ to 3½ per cent., by which a further saving of £140 a year would be effected. The report was adopted; and it was resolved to retain the price of gas at 3s. 4d. per 1000 cubic feet.

The Irvine Gaslight Company had an income last year of £3641, and a profit of £1937. A dividend at the rate of 10 per cent. was declared; and £1066 was carried forward.

The Stow Gaslight Company have paid a dividend at the rate of 5 per cent., and reduced the price of gas by 3d. per 1000 cubic feet.

The Wishaw Corporation gas undertaking earned a profit last year of £730. Out of this sum loans to the amount of £537 were paid off. A motion was made to the effect that the salary of Mr. J. M'Nair, the Gas Manager, be increased by £10 a year. Another Commissioner moved that the increase be £30. He considered that Mr. M'Nair had charge of an undertaking in connection with which £1000 a year could be wasted, if they did not give the Manager encouragement. Under Mr. M'Nair, the works had been re-modelled, and were now a credit to the burgh. The subject was, after some discussion, sent to a Committee.

The Alloa Gas Commissioners had a revenue last year of £7928, of which £6246 was derived from the sale of gas, £840 from tar and ammoniacal liquor, and £758 from coke and refuse lime. The expenditure amounted to £7088; thus leaving a profit of £839. Coal, oil, and lime cost £2758. During the year, £370 was expended on new ammonia plant, meters, and pipes, and £135 upon gas cooking-stoves. The price of gas has been retained at 2s. 6d. per 1000 cubic feet.

The annual report of Mr. John Jack, Gas-Meter Inspector for Edinburgh, shows that the number of gas-meters tested was 58,800, with fees amounting to £1782 13s. 3d. This is the largest number of meters that has been tested in one year since the Magistrates of the city adopted the Sale of Gas Act in 1861. The total number of wet meters tested was 18,287, of which 20 were incorrect; and of the 40,513 dry meters, 277 were found to be incorrect. Up to 1867, the stamping fees averaged only £800 or £900. The increase is partly accounted for by the use of gas stoves and engines, &c., and to a greater extent by the penny-in-the-slot meter.

The accounts of the Dunfermline Gas Commission for the period from May 31, 1896, to May 15 last, have been published. The revenue amounted to £11,682, of which £10,073 was from the sale of gas, £521 from coke, and £815 from tar. The expenditure was £6360, of which coal cost £5059; repairs and renewals, £431; repair, maintenance, and renewal of meters, £164; and repair, maintenance, and renewal of mains, £274. The balance of profit was the handsome sum of £5321.

In his first annual report, the Manager, Mr. Hubert Pooley, says that the number of gas accounts on the books of the Commission was 3926, as against 3251 when the Commissioners took over the undertaking last year. During the period dealt with, 6350 tons of coal and cannel were carbonized—producing 63,587,100 cubic feet of gas, which was an average of 10,014 cubic feet per ton, and 59,130,100 cubic feet were accounted for, which was an average of 9312 feet per ton—the unaccounted-for gas being 4,457,000 cubic feet, or 7·09 per cent. The leakage for the preceding year was 8·59 per cent. Residual products realized £1336, as compared with £1501 for the twelve months before. Though the period dealt with was seventeen days shorter than that covered by the preceding report, there was an increased sale of gas to the extent of 609,500 cubic feet. Thus have the fears of some people that the demand for gas in Dunfermline was likely to decrease been falsified, and the expectations of those who favoured the taking over of the undertaking been verified.

The annual meeting of the Arbroath Gas Corporation was held on Thursday. It was reported that the total income, including a balance from the previous year of £11, amounted to £10,784. The principal items were: Revenue from gas, £9632; profit from chemical works, £1038; and gas-stoves, £60. The expenditure amounted to £16 less than the revenue, the main items being: Coal, £4824; lime, £265; retorts, £226; pipes, 128; meters, £157; salaries and wages, £1514; interest on mortgage loans, £325; sinking fund, £300; annuities, £1353; suspense account for new engine and boiler, &c., £200; sum set aside for harbour, £250. The chemical works accounts showed a total on the credit side of £1937, including the following items: Ammonia sold, £462; naphtha sold, £508; tar, £679; barrels sold, £267; barrels in stock, £19. The debtor side contained the following among the principal items: Balance from previous year, £438; sulphuric acid purchased, £115; barrels, £102; coals, £54; and wages, £110. Mr. Sutherland, the Convener of the Finance Committee, moved the adoption of the accounts. He stated that the revenue from the gas was £284 less than last year; but this was explained by the reduction which had taken place in the price of gas. In regard to the profit from the chemical works, he stated that Mr. Carlow had informed him that if he had been selling the residuals in the same way as in previous years, he would only have received from £370 to £380. Deducting this sum from the £1038, there was a balance left of £668, which was very satisfactory to those who had carried out the works. The accounts were adopted, and, on the motion of Mr. Lorimer, it was remitted to the Finance Committee to consider whether a reduction of the rate of interest on borrowed money could not be effected. The report by the Manager (Mr. R. S. Carlow) stated that the quantity of coal used during the year was 5584 tons, as against 5308 tons in 1895-6. The output of gas amounted to 54,597,200 cubic feet, as against 52,718,600 cubic feet. In the past year, the make per ton of coal carbonized was 9776 cubic feet, which was a decrease of 154 cubic feet per ton, or 1·55 per cent.; and the gas sold per ton had been 8713 cubic feet, which was a decrease of 254 cubic feet, or 2·83 per cent. The unaccounted-for gas for the year 1895-6 was 7·987 per cent. of the quantity made; while last year it was 9·200 per cent. The illuminating power averaged 25·30 candles. The number of consumers for the year ending May, 1896, was 4977; and for the past year the number was 5049. The report was considered to be satisfactory, and was adopted.

It was reported to the Broughty Ferry Police Commissioners this week that during the past year the consumption of gas amounted 33,983,329 cubic feet, the revenue derived from which was £4752, as against an estimate of £4888. Secondary products, which were estimated to produce £1200, only realized £457. It is calculated that in the current year the consumption of gas will amount to 34,020,600 cubic feet, and that the revenue therefore will reach £4757. The total revenue is estimated at £5856, and the expenditure to £9 less. When the accounts were presented, one of the Commissioners criticized them to the extent of pointing out that their policy of reducing the price of gas by 5d. per 1000 cubic feet last year had had the effect of producing a deficit of £92, whereas a year ago they had a surplus of £447. The Convener of the Gas Commission thought that the estimates submitted were capable of being worked out; and the accounts were adopted—the price of gas being retained at 2s. 11d. per 1000 cubic feet. The Commissioners discussed the question of supplying two qualities of gas—one of 25-candle power during the night, for illuminating purposes, and another of from 20 to 22 candle power during the day, for cooking and motive power purposes. The proposal to have two qualities of gas was supported by Mr. M'Laren, the Convener, who considered that they would thereby effect a saving of from £300 to £400 a year. They would not, he said, get any responsible official to admit that two qualities of gas were sent out; but it was well known that it was done. The proposal of the Convener was adopted by 7 votes to 4. I am afraid there will be complaints if the scheme be carried out. What strikes me is this that, if the mains are filled with the high-quality gas during the night, the demand will be so comparatively small in the day that, in the winter, the inferior gas will only be reaching the points of consumption when the time for lighting up comes; and thus, those at any rate who live in the outskirts of the town, will for the first part of the evening be supplied with the inferior gas. If the times of changing were made, say, midday and midnight, then the reverse would happen—consumers near the works would for morning illumination get inferior gas, and for power purposes in the afternoon they would have the better gas. There might be the saving anticipated, from what I would call the arbitrary conduct of the Commissioners in lowering the quality of the gas for part of the day. But consumers would be unequally treated; and surely there is nothing worse in any class of business. If the practice prevails, it is carried on clandestinely; and the Broughty Ferry Commissioners may have the virtue of proposing to do openly what others are doing in secret. Whether open or secret, it is a practice which it might be going too far to call dishonest, but which is, at least, not fair to all the consumers. Of course, if a differential rate were charged, the practice would be altogether unexceptionable.

The Peterhead Gas Commissioners, at their annual meeting this week, advanced the salary of their Manager (Mr. J. Kincaid) by £20 a year. This handsome act was the result of their being able, in the words of Provost Smith, to present the most satisfactory statement which had ever been submitted to the Commissioners. The revenue for the year amounted to £4586, which, notwithstanding that they last year reduced the price of gas 3d. per 1000 cubic, was £21 more than the revenue in the

GAS AND WATER COMPANIES' STOCK AND SHARE LIST (see ante, p. 158).

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p. c.	GAS COMPANIES.			£ s. d.
590,000	10	9 Apl.	10½	Alliance & Dublin 10 p. c.	23—25	..	4 4 0
100,000	10	,,	7½	Do. 7 p. c.	17½—18½	..	4 1 1
300,000	100	1 July	5	Australian (Sydney) 5 % Deb.	106—108	..	4 12 8
200,000	10	27 May	7	Belgrano (B. Ayres), Limited	9½—10	..	7 0 0
100,000	Stck.	29 June	5	Do. 5 p. c. Deb. Stk	103—106	..	4 14 4
200,000	5	27 May	6½	Bombay, Limited	6¾—7	..	4 5 9
40,000	5	,,	6½	Do. New, £4 paid	5¼—5¾	..	4 10 7
380,000	Stck.	26 Feb.	12	Brentford Consolidated	298—303	..	3 19 2
240,000	,,	,,	9	Do. New	223—228	..	3 18 7
50,000	,,	,,	5	Do. 5 p. c. Pref.	145—150	..	3 6 8
159,375	,,	11 June	4	Do. 4 p. c. Deb. Stock.	130—134	..	2 19 9
220,000	Stck.	26 Mar.	11½	Brighton & Hove Original	273—278	..	4 2 8
208,820	,,	,,	8½	Do. A Ord. Stk.	201—206	..	4 2 6
933,500	Stck.	26 Feb.	5	Bristol, 5 p.c. max.	130—135	..	3 14 1
420,000	20	26 Mar.	11½	British	56—57	..	3 18 11
50,000	10	26 Feb.	11½	Bromley, Ordinary 10 p. c.	23—25	..	4 12 0
71,000	10	,,	8½	Do. 7 p. c.	18—20	..	4 5 0
500,000	10	28 Apl.	6	Buenos Ayres (New) Limited	10—11	+¼	5 9 1
200,000	100	1 July	6	Do. 6 p. c. Deb.	100—102	..	5 17 8
150,000	20	15 July	8½	Cagliari, Limited	30—32*	+1	5 3 1
100,000	10	11 June	8	Cape Town & District, Ltd	16¾—17½	..	4 11 8
50,000	50	3 May	6	Do. 6 p. c. 1st Mort.	57—59	..	5 1 8
550,000	Stck.	9 Apl.	13½	Commercial Old Stock	342—347	..	3 17 9
165,000	,,	,,	10½	Do. New do.	257—262	..	4 0 1
165,000	,,	11 June	4½	Do. 4½ p. c. Deb. do.	155—158	+2½	2 16 11
800,000	Stck.	11 June	13	Continental Union, Limited.	250—255	..	5 1 11
200,000	,,	,,	10	Do. 7 p. c. Pref.	212—217	..	4 12 2
51,600	Stck.	26 Feb.	14	Croydon Com'cial A 10 p. c.	317—322	..	4 6 11
163,400	,,	,,	11	Do. B 7 p. c.	255—260	..	4 4 7
535,000	Stck.	26 Feb.	5½	Crystal Palace Ord. 5 p.c. Stk	139—142	..	3 13 11
60,000	,,	,,	5	Do. 5 p. c. Pref.	140—143	..	3 9 11
486,090	10	29 Jan.	11	European, Limited	25—26	+½	4 4 7
354,060	10	,,	11	Do. £7 10s. paid	18—19	..	4 6 11
5,896,590	Stck.	12 Feb.	12¾	Gaslight & Coke, A, Ordinary	315—320	..	3 19 9
100,000	,,	,,	4	Do. B, 4 p. c. max.	113—118	+1	3 7 10
665,000	,,	,,	10	Do. C, D, & E, 10 p.c. Pf.	315—320	+3	3 2 6
30,000	,,	,,	5	Do. F, 5 p. c. Prf.	150—155	..	3 4 6
60,000	,,	,,	7½	Do. G, 7½ p. c. do.	220—225	..	3 6 8
1,300,000	,,	,,	7	Do. H, 7 p. c. max.	207—212	..	3 6 0
463,000	,,	,,	10	Do. J, 10 p. c. Prf.	315—320	+3	3 2 6
476,000	,,	,,	6	Do. K, 6 p. c. Prf.	182—187	..	3 4 2
1,061,150	,,	11 June	4	Do. 4 p. c. Deb. Stk.	138—141	..	2 16 9
294,850	,,	,,	4½	Do. 4½ p. c. do.	155—158	+4	2 16 11
908,000	,,	,,	6	Do. 6 p. c. do.	205—210	..	2 17 1
70,000	10	13 May	6	Hongkong & China, Limited	13½—14½	..	4 2 9
£			p. c.	GAS COMPANIES.			£ s. d.
3,800,000	Stck.	13 May	10	Imperial Continental	223—228	+6	4 7 8
376,400	100	1 Feb.	4	Do. 4 p. c. Debs. Red.	100—103	..	3 17 8
473,600	Stck.	12 Feb.	3½	Do. 3½ p. c. Deb. Stk ,,	104—107	..	3 5 5
75,000	5	29 June	6	Malta & Mediterranean, Ltd.	5½—6	..	5 0 0
560,000	100	1 Apl.	5	Met. of Melbourne, 5p. c. Deb.	112—114	..	4 7 8
250,000	100	,,	4½	Do. 4½ p. c. Debs.	107—109	..	4 2 7
541,920	20	11 June	5	Monte Video, Limited	14½—15½	..	6 9 0
150,000	5	27 May	8	Oriental, Limited	8¼—8¾	..	4 11 5
135,000	5	,,	8	Do. New, £4 10s. paid	7¼—7¾	..	4 12 10
15,000	5	,,	8	Do. do. 1879, £1 paid	1¾—2	..	4 0 0
60,000	5	26 Mar.	7	Ottoman, Limited	5—5¼	..	6 7 3
420,000	100	3 May	6	People's Gas } 1st Mtg. Bds.	104—109	..	5 10 1
500,000	100	1 June	6	of Chicago } 2nd Do.	105—110	..	5 9 1
250,000	10	27 May	10	San Paulo, Limited	14½—15½	..	6 9 0
5,475,000	Stck.	26 Feb.	5¼	South Metrop., 4 p.c. Ord.	144—147	+1	3 11 5
1,416,667	,,	15 July	3	Do. 3 p.c. Deb. Stk.	105—109*	..	2 15 0
60,000	Stck.	12 Mar.	11½	Tottenham & Edmonton, A	275—285	..	4 0 10
60,900	,,	,,	8½	Do. B	190—200	..	4 5 0
182,380	10	27 May	10	Tuscan, Limited	13½—14½	..	6 18 0
149,900	10	1 July	5	Do. 5 p. c. Debs. Red.	100—103	..	4 17 1
				WATER COMPANIES.			
746,159	Stck.	29 June	10½	Chelsea, Ordinary	332—337	..	3 2 4
150,000	,,	,,	5	Do. 5 p. c. Pref.	177—180	..	2 15 6
160,000	,,	,,	4½	Do. 4½ p. c. Pref. Stk., 1875	157—160	..	2 16 3
175,785	,,	26 Mar.	4½	Do. 4½ p. c. Deb. Stock	160—165	..	2 14 6
1,720,560	Stck.	9 Apl.	7	East London, Ordinary	222—227	..	3 1 8
554,740	,,	29 June	4½	Do. 4½ p. c. Deb. Stk.	163—166	..	2 14 3
390,000	,,	,,	3	Do. 3 p. c. Deb. Stk.	106—108	..	2 15 7
700,000	50	11 June	7½	Grand Junction, 10 p.c. max.	120—125	+1	3 0 0
295,000	Stck.	26 Mar.	4	Do. 4 p. c. Deb. Stk.	148—153	..	2 12 4
708,000	Stck.	12 Feb.	12	Kent	347—352	..	3 8 3
160,000	,,	,,	7	Do. New, 7 p. c. max.	212—217	..	3 4 6
1,043,800	100	29 June	9½	Lambeth, 10 p. c. max.	283—288	+3	3 7 8
406,200	100	,,	7½	Do. 7½ p. c. max.	217—222	..	3 7 7
350,000	Stck.	26 Mar.	4	Do. 4 p. c. Deb. Stk.	147—150	..	2 13 4
500,000	100	12 Feb.	13	New River, New Shares.	430—435	..	2 19 8
1,000,000	Stck.	29 Jan.	4	Do. 4 p. c. Deb. Stk.	152—155	..	2 11 7
902,300	Stck.	29 June	5	S'thwk & V'xhall, Ordinary	160—163	..	3 1 3
126,500	100	,,	5	Do. Do. 7½ p. c. Max.	150—153	..	3 5 4
489,200	Stck.	,,	5	Do. Do. 5 p. c. Pref.	173—178	..	2 16 2
1,019,585	,,	9 Apl.	4	Do. 4 p. c. A Deb. Stk.	145—148	..	2 14 2
1,155,066	Stck.	11 June	10	West Middlesex	312—317	..	3 3 1
200,000	,,	,,	4½	Do. 4½ p. c. Deb. Stk.	162—167	..	2 13 11

*Ex div.

preceding twelve months. The expenditure—£2949—had fallen £11. The gross profits had increased from £1603 to £1638. They had, out of this and the balance brought forward, placed £508 to the sinking fund, and paid £535 of interest; and there still remained a balance of £2440. The Manager estimated that, if the price of gas remained the same, the revenue would be £30 or £40 less than last year, and the expenditure £20 or £30 more. This would bring the profit and loss account up to £3018, or an increase of £578, which would be the amount they would have to operate upon. If they reduced the price of gas by 9d. per 1000 cubic feet, this amount would be absorbed. The Committee, the Provost said, recommended that this reduction should be made. Nine years ago, when he was appointed Convener, the price of gas was 6s. 3d. per 1000 cubic feet; and it would now, when he was going out of office, be 4s. 3d. to ordinary consumers, and 3s. 9d. for cooking and motive power purposes. The Provost's proposals were agreed to. The gentleman who seconded them said that the Commissioners had always been fortunate in their Managers, and more especially the present one. Though they were to search Scotland, they would not find a young man who would discharge the duties like Mr. Kincaid. This is a very high compliment—thoroughly deserved, of course, as the results show—but the most pleasant feature of the incident is to see a Manager and his Committee in such complete harmony.

The Elgin Gas Commissioners have also been participants in the wave of prosperity which has characterized the working of gas undertakings during the past year. They had a revenue of £7620, of which £2238 was balance from the preceding year, £4702 was derived from the sale of gas, £12 from meter-rents, £20 from stove-rents, £448 from coke, and £165 from tar. The revenue on the year's working was thus £5382. The expenditure was £4877; leaving a balance of profit of £505. Coal cost £2451; purifying materials, £93; wages, £564; repairs at works, £142; renewal of meters, £26; interest, £540; depreciation, £334; and sinking fund, £120. During the year, £823 was spent on buildings and plant. The gas consumed amounted to 18,811,500 cubic feet. This, it was stated at a meeting of the Commissioners this week, was 1,300,000 cubic feet more than in the year preceding. The Manager (Mr. W. Taylor) estimated that if the price of gas were reduced from 5s. to 4s. 7d. per 1000 cubic feet, they would lose revenue to the amount of £393; but there would still be a surplus of £170 at the end of the current year. The Commissioners agreed to the reduction.

The Cupar Fife Town Council last night had before them the subject of the Corporation acquiring the undertaking of the Gas Company. Bailie Innes, who moved the appointment of a Committee to enter upon negotiations with the Company, said the latter were able to pay a dividend at the rate of 20 per cent. on the original shares; and on the shares as now "watered" they paid 8 per cent. He thought they had a strong case for asking a greater reduction than 2½d. per 1000 cubic feet. He regretted that they did not take over the Company when they had the opportunity, because he believed they would then have got the £25 shares for £28 each. He feared they would not do so now. The price of gas in Cupar was still 5d. per 1000 cubic feet higher than it was in Leven, and 3d. higher than in St. Andrew's. The motion was adopted, and a Committee was appointed.

One of those incidents which, if they were not somewhat mischievous, would be more amusing than annoying, occurred at a meeting of the Stranraer Town Council on Monday. A letter was read from the Secretary of the Gas Company regarding a piece of ground which they would take on feu or lease from the Council. Mr. R. B. Dyer said he would have no objection to grant the request, if, in return, the community were to receive any corresponding benefit from the Gas Company, either in the way of reduction in the price of gas or an increase in the illuminating power. The quality of the gas was anything but good; and the illuminating power was very defective. The Gas Company were a very wealthy corporation. He had heard that they were paying something like 8 per cent., and that they could just as easily pay 20 per cent., but that they preferred to give bonuses to their shareholders. Mr. Belford said the Company would be prepared to pay a very high feu-duty for this piece of ground—say, at the rate of £30 per acre. In regard to the gas, if Mr. R. B. Dyer would make inquiry, he would find that the illuminating power was higher in Stranraer than in most towns in Scotland. The application of the Company was remitted to the Law Committee.

A Committee of the House of Commons has lately passed a Bill to confirm a Provisional Order authorizing the construction of works for a new water supply for Bo'ness. The scheme provides for the construction of a reservoir, 52 acres in extent, and of a capacity of 200 million gallons. The cost of the whole works is estimated at £22,000. The measure was at first opposed by the proprietor of part of the land upon which the reservoir is to be constructed, on the score of amenity, and also on the ground of way-leave for the pipe-track along the avenue leading to her house. But the promoters agreed to pay her £7000; and the opposition was then withdrawn—the Bill passing as an unopposed measure.

CURRENT SALES OF GAS PRODUCTS.

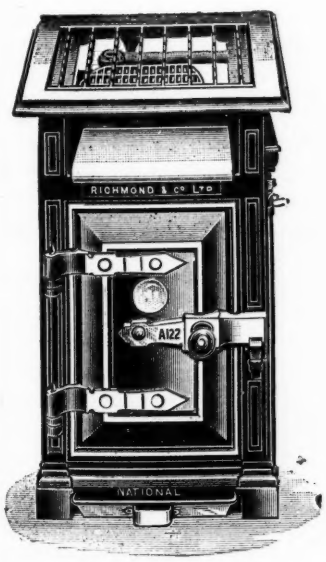
LIVERPOOL, *July* 17.

Sulphate of Ammonia.—A quiet but steady market has again to be recorded; the only weakness apparent being in Scotland, where a few second-hand parcels have been offered. Closing quotations are £7 8s. 9d. to £7 10s. f.o.b. Leith, £7 10s. f.o.b. Hull, and £7 12s. 6d. per ton f.o.b. Liverpool. In the forward position, buyers are showing more disposition to approximate to sellers' ideas of value; but for the most part, they decline to give prices asked. The quotations for delivery up to the end of the year are £7 15s. to £7 17s. 6d.; and £8 per ton is reported to have been paid for spring delivery f.o.b. Leith.

Nitrate of Soda is quieter; producers having failed to come to any agreement to further curtail shipments. Spot quotations are 7s. 6d. per cwt. for good, up to 7s. 7½d. per cwt. for fine, quality.

LONDON, *July* 17.

Tar Products.—Benzols are not quite so brisk as they were—German buyers keeping entirely aloof from the market; but the better demand



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The average values are as follows: Tar, 15s. 6d. to 19s. 6d.; pitch, 18s. to 21s. Benzols, 90's, 2s. 2d.; 50's, 2s. 1d. Toluol, 2s. 2½d. Solvent naphtha, 1s. 7½d. Crude, 30 per cent., naphtha, 1s. Creosote, 2d.; liquid, 2¼d. Heavy oils, 40s. Carbolic acid, 60's, 2s. Pressed naphthalene, 57s. 6d. Creosote salts, 25s. Anthracene, nominal, "A" quality, 6d.; "B," 5d.

Sulphate of Ammonia shows a fair prospect of seeing better prices. Indeed, there are speculative buyers who would pay considerably more than to-day's prices for autumn delivery. The low prices appear to have enlarged the consumption, as big stocks have disappeared during the past few months. Shipments have been active; and stocks in makers' hands to-day are small. Transactions of considerable magnitude have been done at £7 8s. 9d. to £7 12s. 6d., less 3½ per cent.

COAL TRADE REPORTS.

From Our Own Correspondent.

Lancashire Coal Trade.—In gas coals, contracts continue to be placed at practically the same prices as those ruling last year; and one or two important fixtures have been settled during the past week on that very low basis. In the general coal trade, a depressed tone prevails; and even with pits working short time, stocks are accumulating. With regard to prices, there is no change in pit quotations. These are scarcely more than nominal, as there is very little actual business doing at list rates. In the open market, where sellers have to dispose of surplus quantities, prices are easier—special concessions being made to effect clearances; while supplies from Yorkshire are being offered at very low figures. At the pit mouth, best Wigan Arley averages 9s. 6d. to 10s. per ton; Pemberton four-feet and seconds Arley, 8s. to 8s. 6d.; steam and forge coal, 5s. 9d. to 6s. 3d.; engine fuel, 3s. to 3s. 6d. for common, 3s. 9d. to 4s. 3d. for medium, and 4s. 6d. to 4s. 9d. for best qualities. There is a fair business stirring in the shipping trade; but prices are rather easier. Ordinary steam coal delivered at Mersey ports averages 7s. 3d. to 7s. 9d. per ton.

Northern Coal Trade.—There has been considerable activity in the coal trade of this district; but generally the last few days have shown a slight easing off. Best Northumbrian steam coals are firm at 8s. 7½d. to 8s. 9d. per ton f.o.b.; and most of the pits are working fully. Second-class steam coals are 8s. per ton; and steam smalls, 3s. 6d. to 3s. 9d. Gas coals are now in rather larger consumption; but the deliveries only slowly increase. One or two of the collieries that ship coals have good orders in hand for Genoa and the south of Europe. Prices of best Durham gas coals vary from 7s. 3d. to 7s. 6d. per ton f.o.b.; and one or two local contracts have been fixed at prices nearer the lower of these two figures. With the beginning of next month, there will be a larger demand for gas coals, as stocks are then laid in more heavily. Gas coke is steadier, on the whole; the supplies of late having been very limited.

Scotch Coal Trade.—Last week having been the holiday week in the west of Scotland, the coal trade was practically at a standstill; and no prices can be given. The shipments reported amounted to 183,128 tons—a decrease on the preceding week of 9586 tons, but an increase over the corresponding week of last year, of 15,181 tons. For the year to date, the total shipments have been 3,958,961 tons—an increase over the same period of last year of 129,272 tons.

The South Metropolitan Gas Company's Assessments and the Price of Gas.—The Chairman of the Assessment Committee of the Lewisham Union (Mr. W. Brown) expressed the opinion that the raising of the price of gas by the South Metropolitan Gas Company—thus "seeking to penalize the ratepayers of certain parishes because of the undoubted correctness of the assessments in those parishes"—is unwise. We learn from a correspondent that there is a feeling on the various committees and local governing bodies in the districts concerned that the increase in the price of gas for the reasons given in the Company's circular amounts to contempt of Court, and that Counsel's opinion is to be taken on the point.

The Basis of Water-Rates at Portsmouth.—At a recent special meeting of the Portsmouth Corporation Water Committee, the opinion of Counsel was produced upon the question whether the Water Company are legally justified in basing their water charges on the full rent of properties instead of on the rateable value. It may be remembered that the point was referred to Sir Edward Clarke and Mr. H. H. Asquith. The former, in giving his opinion, declares that he cannot speak with certainty; but he believes the Company have the right to levy their charges as now—*i.e.*, on the rent of premises without abatement of any kind. Mr. Asquith, on the other hand, speaks without the slightest hesitation, and declares that the Company possess no such right. They have only power to base their charges on the rateable value, which is always reckoned at 15 per cent. less than the rent. He cites several cases in support of his contention, and draws attention to one in particular in which the High Court ruled that where the words "rateable value or rent" occurred in an Act of Parliament, as they do in the Portsmouth Water-Works Company's Act, they meant rateable value only. The importance of this judgment, which was delivered some three years ago, and has not been appealed against, is fully recognized by the Water Committee, who intend to persevere in the course they have taken, and bring the question to an issue. The next step has been entrusted to the Town Clerk.

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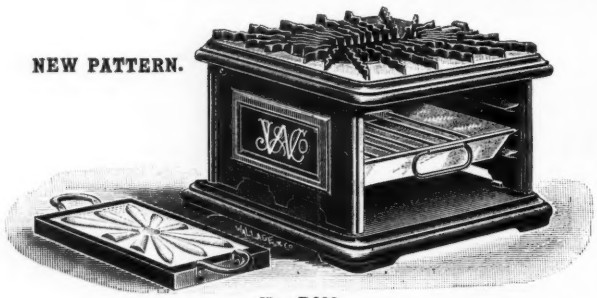

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A New Water Scheme for Shrewsbury.—The Shrewsbury Town Council had before them yesterday week a report by the Gas, Water, and Lighting Committee dealing with the financial side of a scheme, prepared by Messrs. J. Taylor, Sons, and Santo Crimp, for supplying the town with water from the River Severn. In the first place it was recommended that land required at Shelton and Hanwood should be purchased for £3700. Including this sum, the estimated cost of the scheme was put down at £48,000. If this was borrowed at 3 per cent., and repayable in thirty years, the annual expenditure would be £2449; and for this and the repayment of the existing loan, the present rate of 1s. 2½d. in the pound would be sufficient. Some of the members very ardently opposed the scheme on account of the source of supply being the Severn; but the report was adopted by 21 votes to 10. Instructions were given for application to be made to the Local Government Board for sanction to a loan of £48,000.

Messrs. Richmond and Company's Profit-Sharing System.—In the "JOURNAL" a few weeks ago, we announced that Messrs. Richmond and Company, Limited, had decided to introduce profit-sharing in all branches of their business. The outlines of the scheme have now been published; and we learn therefrom that the bonus is calculated on the ordinary salaries of the officers and the daily wages earned by the workmen in the course of the year. The payment of the bonus is to be made whenever the ordinary shareholders receive a dividend of 6 per cent. on their capital. Then 3 per cent. is to be distributed in bonus; rising ½ per cent. for each 1 per cent. additional dividend up to 10 per cent. One-half per cent. will be distributed among the employees for every 1 per cent. in excess of 10 per cent. that is received by the ordinary shareholders. Foremen receive half as much again as the men. Half of the bonus is to be paid in cash to the credit of the employee in the local savings bank; the amount so deposited being his absolute property, to leave on deposit at the current rate of interest or to withdraw as he may think best. The other half of the bonus is to be paid in £1 6 per cent. preference shares issued at par. Or the whole of the bonus may be issued in shares on receipt (before Dec. 31 in any year) of a signed application form, which will be provided for the purpose. The scheme is open to all employees, provided they have qualified by three months' continuous service. But it is stipulated that application for admission is to be made on a form provided for the purpose; and the Directors reserve to themselves the right of withholding from the bonus "any man who takes no interest in the welfare of the Company, or who is wasteful of the Company's property, or careless or negligent in the performance of his duty, or for other sufficient reason." Employees whose service ends by notice, by illness, or by death, are to be entitled to only the cash half of the bonus for that year, and any employee whose employment ceases under circumstances other than those mentioned is to lose his claim to participation in the bonus. The scheme is carried out under the supervision of a Committee of Management, one-half of the members of which are elected by the Directors and the other half by the profit-sharers.

The Proposed New Gas-Works at Padiham.—At the monthly meeting of the Padiham District Council last Thursday, Mr. G. Moorhouse moved a resolution to the effect that a special meeting be held for the purpose of considering an application to the Local Government Board for permission to borrow £26,000 for the construction of gas-works. In doing so, he said the members of the Council were practically agreed that the present works would not meet their requirement very much longer. They were now working very near the mark; and, in view of the increasing demand for gas, an extension would become absolutely necessary before long. He thought they might put themselves in readiness by obtaining borrowing powers, even if the work was deferred for a time. The motion was carried.

Proposed Abolition of Gas-Meter Rents at Oswaldtwistle.—At the last monthly meeting of the Oswaldtwistle District Council, a lengthy discussion took place upon a proposal to abolish gas-meter rents. The supporters of the suggestion urged that, as the gas-works were now a financial success, this step might be taken; and they pointed to the fact that in Manchester, Bolton, and elsewhere these rents had been abolished. Those who opposed the motion did so on the ground that the present was not an opportune time; and they argued that the matter should be deferred until the funds of the Council were in a better condition. An amendment that the discussion be deferred for twelve months being ruled out of order, a vote was taken on the motion that the charges be abolished. Only two voted for it (the mover and seconder); and there were seven against it.

The tender of Mr. W. J. Logan, of Maidstone, has been accepted to construct a reservoir for the Ashford District Council for £3349.

Messrs. W. Parkinson and Co. held a very successful gas exhibition from Monday to Wednesday last week in the Temperance Hall, Newent; Miss Edith Sanderson giving practical demonstrations on cookery twice daily.

Messrs. W. J. Jenkins and Co., of Retford, have been favoured by the Crystal Palace District Gas Company with instructions to supply the necessary iron and steel work and mouthpieces for twelve through beds of retorts in one of their houses, and to alter a number of connections in the same house.

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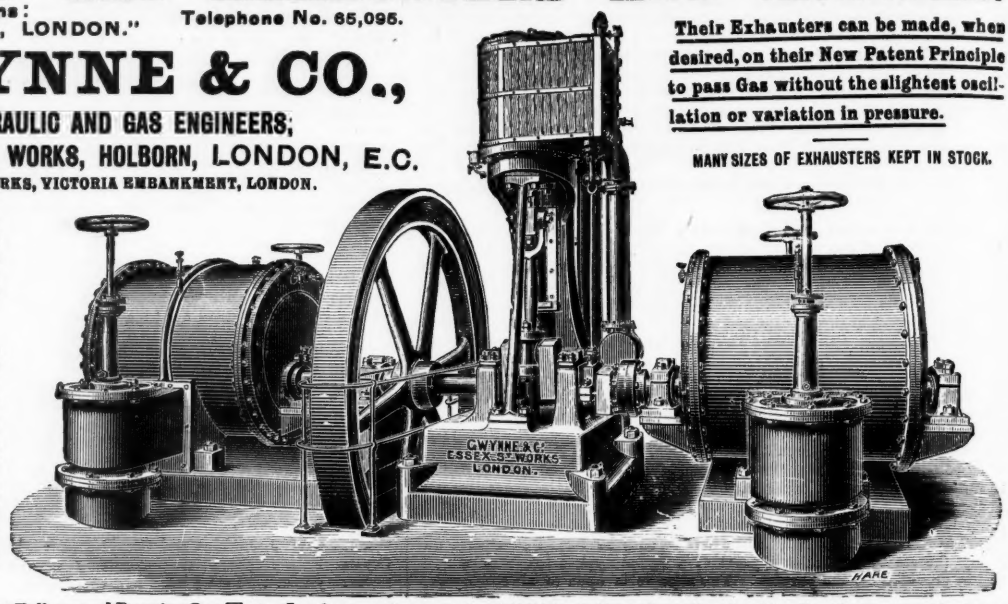

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[For Illustrated Advertisement, see July 6, p. 68.]

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GEO. S. MASON,
Secretary.

Rushden, R.S.O., Northants,
July 10, 1897.

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(GAS DEPARTMENT.)

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Salary to commence at £120 per annum.
Applicants to state Age and Experience, and send not more than three *copies* of recent Testimonials, addressed to the Chairman of the Gas Committee, Town Hall, Salford, before Five p.m., July 29, 1897.
Canvassing will disqualify.

By order,
(Signed) SAML. BROWN,
Town Clerk.

Town Hall, Salford,
July 17, 1897.

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FOR SALE, cheap—
One TELESCOPIC GASHOLDER, 32 ft. diameter, with two lifts 14 ft. deep each; Capacity, 24,500 cubic feet, with Wrought-Iron Tank complete.
One CAST-IRON SCRUBBER, 38 ft. 6 in. by 6 ft. diameter.
Four PURIFIERS, 12 feet square by 4 feet deep with 12-inch Valves and Connections complete.
Two PURIFIERS, 8 feet square, complete, with 6-inch Bye-Pass Valves and Connections.
EXHAUSTERS, 5000 to 60,000 cubic feet per hour.
We would undertake to re-erect any of the above, if desired.
Photos, Particulars, and Prices of above on application to SAML. WHILE AND SONS, 60, Queen Victoria Street, LONDON, E.C.

STRATFORD-UPON-AVON CORPORATION.
(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for the supply of GAS COAL required during the ensuing Twelve Months.
Forms of Tender and full Particulars of Quantity required can be obtained of

J. S. CRANMER,
Manager.

GLASGOW CORPORATION.
(GAS DEPARTMENT.)

TENDERS FOR PURIFIERS, &c.

THE Corporation of Glasgow invite TENDERS for the construction of Four PURIFIERS and the IRON and STEEL WORK of Extension of ROOFS of Purifier-House and Lime-Store to be erected at their Dawsholm Gas-Works.
Copies of Specification and Form of Tender may be obtained, and Plans seen, at the Engineers' Office, 45, John Street, Glasgow.
Sealed offers, endorsed "Tender for Purifiers, &c.," and addressed to the subscriber, will be received by him not later than Tuesday, the 27th curt.
The Corporation do not bind themselves to accept the lowest or any offer.

J. D. MARWICK,
Town Clerk.

City Chambers, Glasgow,
July 7, 1897.

SHEFFIELD UNITED GASLIGHT COMPANY.

TO IRONFOUNDERS, &c.

THE Directors of this Company invite TENDERS for the supply and delivery of CAST-IRON COLUMNS and GIRDERS, WROUGHT-IRON TIE-RODS, &c. (weighing about 175 tons), required in the construction of underground Tar and Liquor Tanks at their Grimesthorpe Station.
Drawings may be seen, and Specification with Bill of Quantities obtained, on application to the Engineer, Mr. Fletcher W. Stevenson, on payment of 10s. 6d., which will be returned on receipt of a *bond-fide* tender.
Sealed tenders, endorsed "Tender for Ironwork for Liquor Tanks," must be delivered by post to the undersigned at the Company's Offices not later than the first post on Saturday, the 31st day of July.
The Directors do not bind themselves to accept the lowest or any tender.

HANBURY THOMAS,
General Manager and Secretary.

Commercial Street, Sheffield,
July 6, 1897.

SHEFFIELD UNITED GASLIGHT COMPANY.

FIRE-CLAY GOODS.

THE Directors of this Company invite TENDERS for the supply of FIRE-CLAY GOODS required in the construction of Thirty Vaults for Retort-Benches at their Grimesthorpe Station.
Specification and Form of Tender may be obtained on application to the Company's Engineer, Mr. Fletcher W. Stevenson.
Sealed tenders, endorsed "Tender for Fire-Clay Goods," must be delivered to the undersigned (by post) at the Company's Offices not later than the first post on Saturday, the 31st day of July.
The Directors do not bind themselves to accept the lowest or any tender.

HANBURY THOMAS,
General Manager and Secretary.

Commercial Street, Sheffield,
July 6, 1897.

TAR.

THE Directors of the Cheltenham Gas- light and Coke Company invite TENDERS for the purchase of their surplus TAR for One, Two, or Three Years, commencing on the 1st day of October next.
Estimated Quantity, 2000 Tons per Year.
Tenders to state Price per Ton free on Rails at Cheltenham.
The Directors do not bind themselves to accept the highest or any tender.

R. O. PATERSON,
Manager.

Gas-Works, Cheltenham,
July 3, 1897.

OSWALDTWISTLE URBAN DISTRICT COUNCIL.

THE Gas Committee invite Tenders for the TAR and LIQUOR produced at their Works for One Year from the 31st day of July, 1897.
The quantity of Coal carbonized is about 3500 Tons.
Further Particulars may be obtained from the Manager, Gas-Works, Church, near Accrington.
Tenders, endorsed "Tender for Tar," to be addressed to me, and to be delivered not later than Thursday, the 29th of July.

WM. SANDEMAN,
Clerk.

District Council Offices,
Oswaldtwistle, July 16, 1897.

WOKINGHAM CORPORATION GAS-WORKS.
(GAS DEPARTMENT.)

SURPLUS TAR AND LIQUOR.

THE Gas Committee invite Tenders for the surplus TAR and LIQUOR made at their Works for One Year.
Tenders to state Price per Gallon for Tar and per Barrel for Liquor at 5°, 6°, and 7° Twaddel.
Tenders to be sent in on or before the 24th inst.
The Committee do not bind themselves to accept the highest or any tender.

A. G. BATES,
Secretary and Manager.

July 15, 1897.

EDINBURGH AND LEITH CORPORATIONS' GAS COMMISSIONERS.

STEEL TUBULAR CONDENSER AND CONNECTIONS.

THE Gas Commissioners are prepared to receive TENDERS for the construction and erection at their Baltic Street Works, Leith, of a STEEL TUBULAR CONDENSER, with Cast-Iron Connections, &c.
Specification and Schedule of Quantities may be obtained on application to Mr. W. R. Herring, Chief Engineer and Manager to the Commissioners; and Plans and detailed Drawings may be inspected on application at his Office.
Tenders are to be lodged with the undersigned not later than Monday, the 26th inst., at Ten a.m., endorsed "Tender for Condenser."
The Commissioners do not bind themselves to accept the lowest or any offer.

JAMES M. G. JACK,
Clerk.

25, Waterloo Place,
Edinburgh, July 13, 1897.

TO GASHOLDER MAKERS.

THE Bridlington Gas Company invite TENDERS for the construction and erection of a SINGLE-LIFT GASHOLDER, prepared for Telescoping, 98 feet in diameter, by 25 feet deep, on their Premises at Bridlington.
The Drawings and Specification may be seen at the Offices of the Company, and at the Office of Messrs. Thomas Newbigging and Son, Engineers, 5, Norfolk Street, Manchester.
Copies of the Bill of Quantities and Forms of Tender may be obtained from the latter on deposit of Two Guineas, which will be returned on receipt of a *bond-fide* tender.
Sealed tenders, endorsed "Gasholder, Contract No. 2," addressed to the Chairman, Gas Company, Bridlington, to be sent so as to reach me not later than Ten a.m., on Tuesday, the 3rd day of August, 1897.
The Company do not bind themselves to accept the lowest or any tender.

J. C. ARCHER,
Secretary.

Gas Offices, Bridlington,
July 15, 1897.

TO GASHOLDER AND PURIFIER MAKERS.

THE Town Commissioners of Cashel, County Tipperary, Ireland, invite TENDERS for the erection of a new TWO-LIFT TELESCOPE GASHOLDER (counter-balance), to be placed in a Stone Tank already erected.
Also two new PURIFIERS, 5 ft. by 4 ft., with the necessary Connections, Valves, and Lifting Gear.
Also the RE-LAYING of MAINS on Works.
Plans and Specifications to be seen at the Town Hall, Cashel.
Sealed tenders, to be addressed to the Town Clerk, Cashel, County Tipperary, Ireland, and endorsed "Tender for Gasholder, &c.," will be received by the undersigned not later than Twelve o'clock noon, on the 2nd of August next.
The Contractor will be obliged to enter into a Bond with two solvent sureties for the due completion of Contract, to the satisfaction of the Engineer appointed by the Board.
Anyone requiring Plan and Specification must apply personally, and check all Measurements in the Specification.
The Commissioners do not bind themselves to accept the lowest or any tender.

By order,
JOHN O'LEARY,
Town Clerk, &c.

Town Hall, Cashel,
July 7, 1897.

BRIERLEY HILL DISTRICT GASLIGHT COMPANY.

TENDERS FOR TAR.

THE Directors of the above Company are prepared to receive TENDERS for surplus TAR made at their Brierley Hill and Kingswinford Works, for One Year ending the 30th of June, 1898, delivered into Boats at the former place in One Hour and at the latter in Twelve Hours.

Tenders to be addressed to the Chairman, and delivered not later than the 24th inst.

The Directors do not bind themselves to accept the highest or any tender.

HENRY M. JACKSON,
Secretary.

Gas-Works, Brierley Hill,
July 12, 1897.

SOUTH METROPOLITAN GAS COMPANY.

NOTICE is Hereby Given, that the ORDINARY HALF-YEARLY GENERAL MEETING of the Proprietors of this Company will be held at the Bridge House Hotel, London Bridge, in the Borough of Southwark, on Wednesday, the 11th day of August next, at Two o'clock in the afternoon precisely, to receive the Directors' Report and the Accounts of the Company for the Half Year ending the 30th of June last, and to declare a Dividend for the same period.

The TRANSFER BOOKS WILL BE CLOSED from the 28th day of July, until after the Meeting.

By order,
FRANK BUSH,
Secretary.

Offices: 709A, Old Kent Road, S.E.,
July 17, 1897.

CRYSTAL PALACE DISTRICT GAS COMPANY.

NOTICE is Hereby Given, that the ORDINARY HALF-YEARLY GENERAL MEETING of the Proprietors of this Company will be held at the Albion Tavern, Aldersgate Street, London, E.C., on Friday, the 6th day of August, 1897, at Three o'clock precisely, to receive the Report of the Directors and Statement of Accounts for the Half Year ended the 30th of June last, to declare a Dividend, and for General Purposes.

The TRANSFER BOOKS WILL BE CLOSED from the 23rd day of July until after the Meeting.

By order of the Board,
CHARLES M. OHREN,
Secretary.

Offices and Works: Lower Sydenham, S.E.,
July 23, 1897.

THE GASLIGHT AND COKE COMPANY.

SALE BY AUCTION OF
£25,000
ORDINARY "A" CONSOLIDATED STOCK.

IN pursuance of The Gaslight and Coke Company Act, 1876, Notice is Hereby Given, that it is the intention of the Directors of this Company to SELL BY AUCTION, at the Auction Mart, Tokenhouse Yard, in the City of London, on Monday, the 9th day of August next, at Two o'clock p.m., £25,000 of NEW ORDINARY "A" CONSOLIDATED STOCK of the Company, to be paid up in full on or before the 31st of August next; such Stock being the first portion of Additional Capital proposed to be raised, in pursuance of the Powers of the said Act, under the authority of a Resolution to be submitted to the Half-Yearly Ordinary General Meeting of the Proprietors of the Company to be held on Friday, the 6th day of August next.

By order,
JOHN WILLIAM FIELD,
Secretary and General Manager.

Chief Office: Horseferry Road,
Westminster, S.W., July 15, 1897.

SOUTHWARK & VAUXHALL WATER COMPANY.

SALE BY TENDER OF £100,000 THREE PER CENT. DEBENTURE STOCK.

NOTICE is Hereby Given, that it is the intention of the Directors of the Southwark and Vauxhall Water Company to SELL BY TENDER, to be received at the Company's Office, Southwark Bridge Road, S.E., not later than Twelve o'clock noon on Tuesday, the 27th day of July, 1897, £100,000 DEBENTURE STOCK of the Company.

The Stock now for sale is the second portion of the Capital authorized by, and to be issued under, the Provisions of the Southwark and Vauxhall Water Act, 1894, and will be entitled, from the 30th day of September, 1897, to Interest at the rate of 3 per cent. per annum. It will be known as Debenture Stock "B," and may be redeemed at par at any time after the expiration of 25 Years from the date of issue, subject to Six Months' previous Notice of the intention to redeem. Debenture Stock "B" will rank for Interest and otherwise *pari passu* with the other Debenture Stock of the Company, but before the Ordinary and Preference Stock and Share Capital. It is a lawful investment for Trustees.

For Particulars, Forms, and Conditions of Tender, apply at the Office of the Company, Southwark Bridge Road, S.E.

By order of the Board of Directors,
MONTAGUE WATTS,
Secretary.

Southwark Bridge Road, S.E.,
July 13, 1897.

Price 6s., Cloth Bound,

THE CHEMISTRY OF ILLUMINATING GAS.

By N. H. HUMPHRYS, Assoc M.Inst.C.E., F.C.S.

LONDON:
WALTER KING, 11, Bolt Court, Fleet Street, E.C.

By Order of the Directors of
THE GASLIGHT AND COKE COMPANY.

ISSUE OF £25,000 "A" ORDINARY STOCK.

MR. ALFRED RICHARDS is favoured with Instructions from the Directors to SELL BY AUCTION, at the Mart, Tokenhouse Yard, London, E.C., on Monday, Aug. 9, 1897, at One for Two o'clock precisely, in Lots,

£25,000 OF "A" ORDINARY STOCK
OF
THE GASLIGHT AND COKE COMPANY,

ranking for a Standard Dividend of 10 per cent. subject to the Sliding-Scale; the last Dividend on the Company's "A" Stock having been at the rate of
12½ PER CENT. PER ANNUM.

Particulars may be obtained at the OFFICES of the COMPANY, in Horseferry Road, WESTMINSTER; and of MR. ALFRED RICHARDS, Auctioneer, 18, FINSBURY CIRCUS, E.C.

By Order of the Directors.
ALDERSHOT GAS AND WATER COMPANY.

NEW ISSUE OF 300 £10 FIVE PER CENT. PREFERENCE SHARES.

MR. ALFRED RICHARDS will Sell the above BY AUCTION, at the Mart, E.C., on Monday, July 26, at One o'clock precisely, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the
COLNBROOK GAS COMPANY, LIMITED.

MR. ALFRED RICHARDS will Sell by AUCTION, at the Mart, Tokenhouse Yard, E.C., on Monday, July 26, at One o'clock, as a going concern, the FREEHOLD GAS-WORKS of the Colnbrook Gas Company, Limited, advantageously situate at Colnbrook, about 16 miles from Town, and within easy distance of Colnbrook Station, G.W.R.

The Plant comprises five Retorts, Coal-Store, Condenser Washer-Scrubber, two Purifiers, and Gasholder, together with the Mains. Possession will be given on completion.

May be viewed and Particulars obtained of Messrs. GARNER AND SON, Solicitors, 159, High Street, UXBRIDGE; and of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

ISSUE OF STOCKS AND SHARES BY AUCTION UNDER PARLIAMENTARY POWERS.

MR. ALFRED RICHARDS undertakes the issuing by Auction of GAS AND WATER SHARES under Parliamentary Power.

He also holds MONTHLY SALES of GAS AND WATER SHARES at the Auction Mart, Tokenhouse Yard, E.C.

Terms for the issuing of Capital, and also for offering to auction Gas and Water Shares, and all Particulars relating thereto, may be had of Mr. Alfred Richards.

Offices: 18, FINSBURY CIRCUS, E.C.

By Order of the Directors.
TO TRUSTEES, INVESTORS, AND OTHERS.

NOTICE of Sale by Auction by Messrs. CRAWTER, at the Mart, Tokenhouse Yard, E.C., on Wednesday, Aug. 11, 1897, at Two o'clock precisely, of 625 SHARES of £10 each in the WALTHAM ABBEY AND CHESHUNT GAS AND COKE COMPANY, and known as "C" Shares, which, according to the present Price of the Company's Gas, entitles the Purchasers to a Dividend, when earned, of 10½ per cent.; thus offering a sound Investment of the most solid kind.

Particulars may be obtained at the OFFICES of the Company, Waltham Abbey, Essex; at the Mart; of Mr. J. CRAWTER, Land Agent, 41, BEDFORD ROW, W.C.; or of Messrs. CRAWTER, Land Agents and Auctioneers, Cheshunt, HERTS.

E. ASQUITH & CO.,
Hydraulic Engineers,
17, Mather Street, Ancoats, Manchester,
Fit up Plants for
Pressing Anthracene, Naphthalene, &c.
Competent Men sent out to erect same. Estimates given.

PRICE'S COKE & COAL BARROW

effects a great saving of time, labour, and expense.

For Particulars, Price, &c., apply to Mr. EDWARD PRICE, 119, Queen's Road, FINSBURY PARK, N.

Prices are Reduced.

HEATHCOTE GAS COAL.

Rich in Illuminating Power and Yield of Gas. Above the Average in Weight and Quality of Coke.

Maintains a High Standard in Residuals.

THE GRASSMOOR CO., LD.,
CHESTERFIELD.

ROBERT MARSHALL,
CANNEL COAL MERCHANT
97, WELLINGTON STREET, GLASGOW.

Prices and Analysis of all the Scotch Cannels on Application.

HEBBURN MAIN GAS COALS.

Yield of Gas per ton . . . . . 10,500 cub. ft.
Illuminating Power . . . . . 16·4 candles.
Coke . . . . . 68 per cent.

For Prices, f.o.b. Ship or Delivered by Rail, apply to
THE WALLSEND & HEBBURN COAL COMPANY, LTD.
8 Lombard Street,
NEWCASTLE-ON-TYNE.
W. RICHARDSON, Fitter.

HUNTER'S
OXIDE OF IRON.

JAMES HUNTER, MINER AND SHIPPER OF
NATURAL IRISH BOG ORE.

This Estate yields the finest and most uniform quality in Ireland; and the quality is guaranteed.

Samples and Prices on application.

5, PRINCES STREET, PORT GLASGOW.

Telegrams: "HUNTER, PORT GLASGOW."

Established 1872.

EVESON FOR CANNEL

TELEGRAMS:
"EVESON, BIRMINGHAM."

HOLMSIDE GAS COALS.

PRESENT DAILY PRODUCE OVER 4000 TONS.

LATEST ANALYSIS—By CHARLES PHILLIPS, Gas Examiner to Rotherham Corporation.

Yield of Gas Per Ton . . 11,205 Cubic Feet.
Illuminating Power, 16 7/10 Stand. Sperm. Candl.
Coke (of good & pure quality) 13¾ Cwt. Per Ton.
Sulphur . . . . A little over 1 Per Cent.
Ash . . . . . Under 1 Per Cent.
Tar . . . . . 163 Lbs. (Avoir.) Per Ton.
Ammoniacal Liquor 103 Lbs. (Avoir.) Per Ton.

HOLMSIDE GAS COALS are supplied to the largest Gas Companies in England and on the European Continent; London alone consuming about half the produce.

SOUTH MOOR PELTON GAS COALS.

PRESENT DAILY PRODUCE AVAILABLE 2500 TONS.

RESULTS OF DIFFERENT ANALYSES:—

Yield of Gas Per Ton . . 10,500 Cubic Feet.
Illuminating Power . 17 Stand. Sperm Candl.
Coke (of excellent quality) . 13½ Cwt. Per Ton.
Sulphur . . . . . 1·13 Per Cent.
Ash . . . . . 1·34 Per Cent.
Tar . . . . . 180 Lbs. (Avoir.) Per Ton.
Ammoniacal Liquor 94½ Lbs. (Avoir.) Per Ton.

The HOLMSIDE and SOUTH MOOR COAL-FIELD possesses *a very great quantity of the best Coal;* and, whilst other Coal-Fields are becoming exhausted, this one is only being opened out, so that *the quality* of both the HOLMSIDE COALS, and the SOUTH MOOR COALS *may be relied upon for all practical purposes.*

These Coals may be bought through the Principal Merchants in England, or direct from

MR. MARK ARCHER,
HOLMSIDE AND SOUTH MOOR OFFICES,
NEWCASTLE-UPON-TYNE.

TROTTER, HAINES, & CORBETT,
Brettell's Estate
FIRE-CLAY & BRICK WORKS,
STOURBRIDGE.

Manufacturers of GAS-RETORTS, GLASSHOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS, TILES, and every description of FIRE-BRICKS.

Proprietors of
BEST GLASSHOUSE POT & CRUCIBLE CLAY.
SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.

LONDON OFFICE: R. CULL, 34, OLD BROAD ST., E.C.

NEWBATTLE CANNEL.
Highest Results in Gas, & Excellent Coke.

QUOTATIONS ON APPLICATION TO
THE LOTHIAN COAL COMPANY,
LIMITED,
NEWBATTLE COLLIERIES,
DALKEITH, N.B.

LONDONDERRY GAS COALS
FROM THE
MARQUIS OF LONDONDERRY'S COLLIERIES,
COUNTY OF DURHAM.

Available output up to 5000 tons per day.
Yield of Gas 11,000 cubic feet per ton of Coal as per analysis by
Mr. John Pattinson, F.C.S., F.I.S.

FOR PRICES AND PARTICULARS, APPLY TO
S. J. DITCHFIELD,
SEAHAM HARBOUR, COUNTY OF DURHAM.

THORNLEY GAS COALS
WORKED BY THE
WEARDALE IRON & COAL Co., Ld.
OUT OF THEIR
THORNLEY AND WHEATLEY HILL COLLIERIES.

Analysis made by
Messrs. J. & H. S. PATTINSON, *May 28, 1895.*

Yield of Gas per Ton . .	10,500 Cub. Ft.
Illuminating Power . .	16·9 Candles.
Coke (of good quality) . .	67·5 per Cent.
Sulphur	0·58 „
Ash	2·73 „

For Price, &c., apply to the
WEARDALE IRON & COAL Co., Ld.
QUAYSIDE, NEWCASTLE-ON-TYNE.

UNEQUALLED.
Gas Companies are solicited to try Samples of the
MIRFIELD
BLACK BED GAS COAL.
Prices and Analysis on application.
MIRFIELD (GAS-COAL) COLLIERY COMPY.
RAVENSTHORPE, NEAR DEWSBURY.

JAMES OAKES & Co.,
ALFRETON IRON-WORKS, DERBYSHIRE,
AND
Wenlock Iron Wharf, 21 & 22, Wharf Road,
CITY ROAD, LONDON, N.,
Manufacture and keep in Stock at their Works (also large stock in London)
PIPES and CONNECTIONS, 1¼ to 48 inches in diameter, and make and erect to order RETORTS, PURIFIERS and TANKS, with or without planed joints, COLUMNS, GIRDERS, SPECIAL CASTINGS, &c., required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.
NOTE.—Makers of HORSLEY'S PATENT SYPHONS. These are cast in one piece, without Chaplets; doing away with bolts, nuts and covers, and rendering leakage impossible.

BOLDON GAS COALS.
ANALYSIS.

Yield of Gas per ton . .	10,500 Cubic Feet.
Illuminating Power . .	16·9 Candles.
Coke	66·7 Coke.
Sulphur	0·86 Sulphur.
Ash	2·04 Ash.

For Prices, &c., apply to
W. H. PARKINSON,
THE HARTON COAL CO., LTD.,
NEWCASTLE-ON-TYNE.
Telegraphic Address: "PARKINSON NEWCASTLE."

THOMAS TURTON AND SONS, LIMITED,
SHEAF WORKS, SHEFFIELD,
MANUFACTURERS OF
FILES OF BEST QUALITY
FOR ENGINEERS.
STEEL OF ALL DESCRIPTIONS.
SCREW STOCKS, TAPS AND DIES,
SPANNERS, RATCHET BRACES, LIFTING JACKS,
ANVILS, VICES,
AND ENGINEERS' TOOLS GENERALLY.
LONDON OFFICE:
90, CANNON STREET, E.C.

THE SILICA FIRE-BRICK COMPANY,
OUGHTIBRIDGE, near SHEFFIELD,
MANUFACTURE
SILICA BLOCKS, BRICKS, AND CEMENT
OF SUPERIOR QUALITY
FOR GAS-FURNACES.
Trade Mark: "SILICA."

These Goods (largely used in Gas, Glass, Iron, and Steel Works) are, on account of their
GREATER DURABILITY,
Strongly recommended where EXCESSIVE HEATS have to be maintained.

Awarded HIGHEST MEDAL and DIPLOMA at the Newcastle-on-Tyne Royal Mining and Industrial Exhibition, 1887,
for
CANNEL & COAL.

TYNE BOGHEAD CANNEL.

Yield of Gas per ton	13,155 cub. ft.
Illuminating Power	38·22 candles.
Coke per ton	1,301·88 lbs.

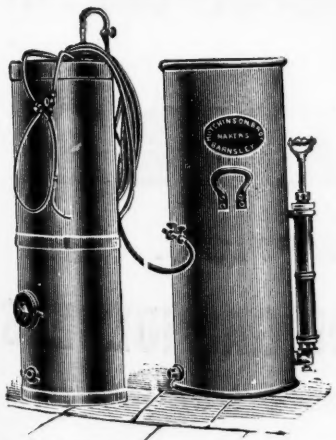
EAST PONTOP GAS COAL.

Yield of Gas per ton	10,500 cub. ft.
Illuminating Power	17·8 candles.
Coke	70 per cent.

SOUTH PELAW MAIN GAS COAL.

Yield of Gas per ton	10,500 cub. ft.
Illuminating Power	16·3 candles.
Coke	73·1 per cent.

For Prices and complete Analysis, apply to
THOS. W. DANCE & SONS,
COAL OWNERS, NEWCASTLE-ON-TYNE;
OR
E. FOSTER & CO.,
21, JOHN STREET, ADELPHI, LONDON, W.C.



Gas-Generator. Air-Blower.
IMPROVED LEAD-BURNING APPARATUS.

HUTCHINSON BROS.,
GAS ENGINEERS, &c.
SPECIALITY.
LEAD WORK FOR SULPHATE OF AMMONIA PLANTS.
BEST QUALITY OF MATERIAL AND WORKMANSHIP.
SATURATORS, all Lead, or Strong Sheet Lead, in Wood Casing,
ACID TANKS, ELEVATORS, AND COCKS. LIQUOR AND LIME PUMPS OR INJECTORS.
Liquor-Cocks, Gauge Fittings, and Safety-Valves in Cast Iron.
HYDROMETERS, TEST-JARS (GLASS OR LEAD), COPPER SCOOPS, &c., &c.
IMPROVED LEAD-BURNING APPARATUS.
LEAD BURNERS SENT OUT TO REPAIRS.
FALCON WORKS, BARNSLEY.
Telegrams: "HUTCHINSON BROS., BARNSLEY."

The 'SUNLIGHT' INCANDESCENT GAS-BURNER

COMBINES HIGH ILLUMINATING POWER and GREAT ECONOMY OF GAS with a SOFT, PLEASANT LIGHT.

THE NEAREST APPROACH TO SUNLIGHT.

THE IDEAL LIGHT FOR DOMESTIC USE.

Price from **5/3** Complete.

"COSMO" BURNERS Complete, as shown, 12-inch Shade, 7/9 each. Price List and Terms on Application.

THE NEW INCANDESCENT (Sunlight Patent) GAS LIGHTING CO., Ltd., 33 & 34, Shoe Lane, LONDON, E.C.

S. CUTLER AND SONS, MILLWALL, LONDON.

CARBURETTED WATER-GAS PLANT.

(CUTLER'S PATENTS)

ADOPTED AT HORNSEY, HASTINGS, SOUTHEND,

PLYMOUTH, BUENOS AYRES, SOUTHALL (BRENTFORD GAS COMPANY).

GASHOLDERS

OF EVERY SIZE AND DESCRIPTION.

CUTLER'S PATENT GUIDE-FRAMING FOR GASHOLDERS

HAS BEEN ADOPTED FOR MANY IMPORTANT HOLDERS.

IT IS STRONG AND CHEAP, AND REQUIRES NO PIERS FOR ITS SUPPORT.

THE "TRAFALGAR"
PREPAYMENT GAS-METER
FOR PENCE, SHILLINGS, OR ANY COINAGE.

THE ADVANTAGES OF THIS SYSTEM ARE:

1. Simplicity of Mechanism.
2. Absolute Accuracy.
3. Impossibility of being tampered with.
4. Unaffected by irregularities in shape or thickness of the penny.
5. Can be fixed to any ordinary Wet or Dry Meter.
6. Extra large Money-Box.
7. Price Changer can be altered without otherwise disturbing the Meter.
8. Index showing number of pennies in the mechanism at any time.
9. Rejection of half-pennies certain.

GUARANTEED FOR FIVE YEARS.

FRANK WRIGHT'S PREPAYMENT GAS-METER CORPORATION, Limited,

Telegraphic Address: "Gasometer, London." Manufacturers of Wet and Dry Gas-Meters. Offices and Works: **62, GLENGALL ROAD, S.E.** Telephone No. 59 Peckham.

TELEGRAMS: "FIRECLAY," LEEDS.

TELEPHONE No. 612.

BRANDS: CLIFFS', INGHAMS', BROOKES'.

The Leeds Fireclay Co. Ltd
WORTLEY, LEEDS.
ENGINEERING DEPARTMENT.

CONTRACTORS for
BUILDINGS, ROOFS,
RETORT SETTINGS & IRONWORK
COAL AND COKE
BREAKING, ELEVATING, CONVEYING,
AND STORAGE PLANT.
RE-SETTING EXISTING RETORTS.
RETORT HOUSE WORK GENERALLY

MANUFACTURERS of
HORIZONTAL & INCLINED
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RETORTS,
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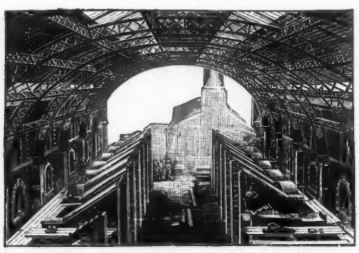

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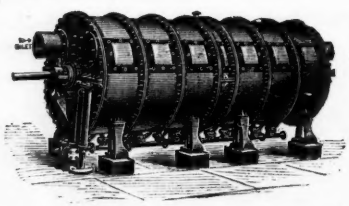

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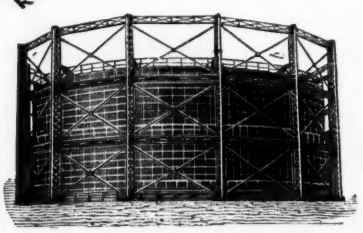

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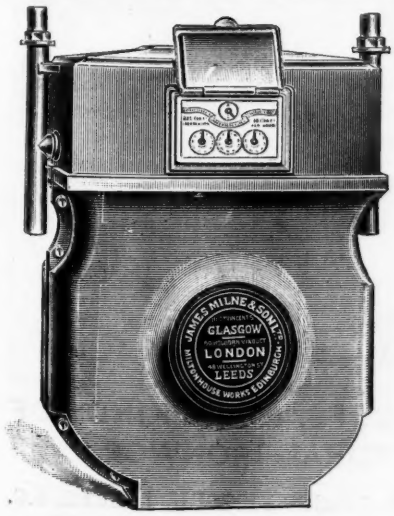

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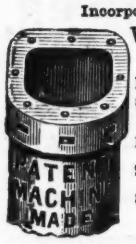

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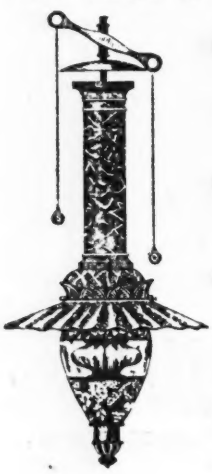

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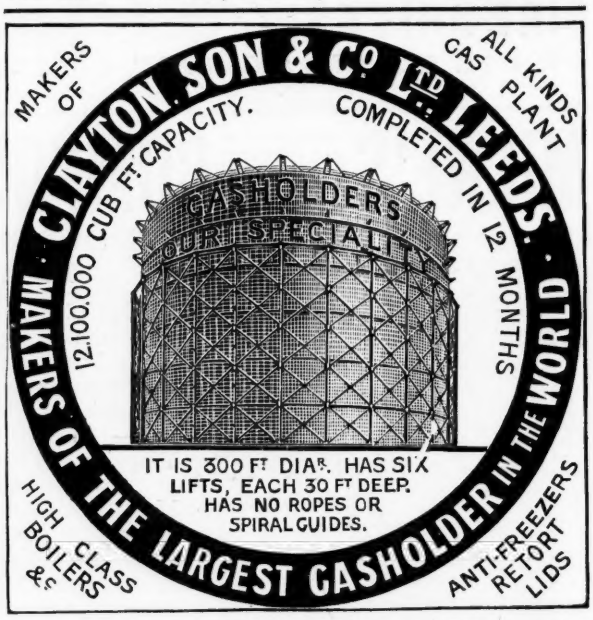
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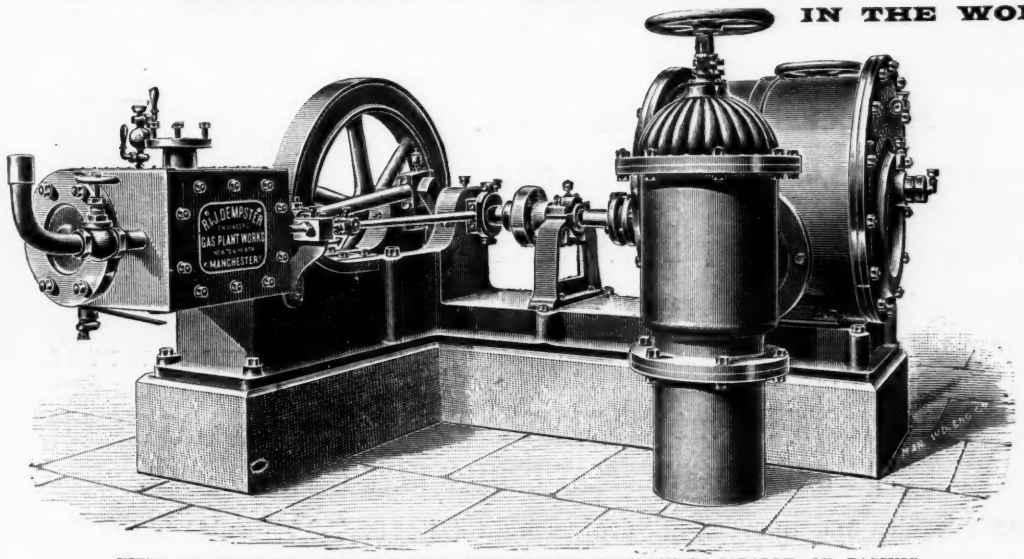

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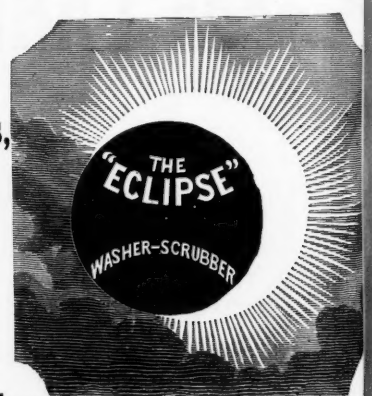

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